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Supply and Demand University Graduates 1965 - 1966

Executive and Professional Division
NATIONAL EMPLOYMENT SERVICE
Department of Labour
Ottawa

Hon. Allan J. MacEachen
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Deputy Minister



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INTRODUCTION

THIS BOOKLET relating to the supply and demand of 1966 university graduates is one of two similar booklets published annually by the Executive and Professional Division of the National Employment Service. It is intended primarily for distribution to under-graduate, graduating, and graduate students at Canadian universities and colleges. Booklets are also available for distribution to the graduating classes of high schools. The information contained in this booklet may also be of value to prospective employers of university graduates, to teachers, and to vocational counsellors.

Information relating to the employment prospects of the 1966 class of university graduates is presented, as well as trends of significance in the university field relating to employment. The sizes of the graduating classes in each of the disciplines at the different universities are estimated from enrolments during the 1964-65 academic year. Caution should therefore be observed in using this information, but these estimates should provide reasonably accurate guides.

The introduction contains information relating to developments at universities and colleges generally, while the body of the booklet is divided into different sections relating to graduation disciplines. The concluding section describes the work of the NES Student Placement Service and lists the institutions served by the National Employment Service. The tabulations of estimated graduating classes are contained in an appendix at the end of the booklet while a table relating to estimated monthly starting salaries for those students who graduated in 1965 precedes the graduation tabulations.

The 1966 supply and demand booklet relating to graduating technological students is the first edition of that booklet to be published and is available on request. The format of the technological booklet is similar to this booklet and its distribution is the same except that students at technological institutes receive the booklet instead of university students.

Graduations

The number of students graduating in 1966 is expected to be approximately 43,000 or about 15 per cent larger than the class of 1965.

During the two-year period from 1961-62 until 1963-64 the number of those graduating with Bachelor degrees increased by about 25 per cent to a total of almost 30,000. The number obtaining Master's degrees increased by about one third to more than 3,700 and the number obtaining doctorates increased by 50 per cent to nearly 500. Current reports from graduate schools across Canada indicate that just as dramatic comparisons can be expected in the immediate future.

On the basis of enrolment predictions made by Dr. E. F. Sheffield of the Canadian Universities Foundation, R. D. Mitchener, Chief of the Higher Education Section of the Dominion Bureau of Statistics, estimated in 1964 that Canada would graduate about 850,000 persons with first degrees during the period from 1963-64 to 1976-77.

Enrolments

Full-time enrolments at Canadian universities and colleges reached 180,000 students during the 1964-65 academic year, an increase of nearly 14 per cent over the total enrolment of approximately 158,000 recorded during the 1963-64 academic year. Enrolments for 1965-66 should be approximately 25,000 higher than those recorded for 1964-65 if the same percentage rate of increase of 14 per cent continues.

Several provinces have announced plans for the establishment of new universities and additional junior or community college systems to meet the demand for more academic space. Quebec, Ontario, and British Columbia have been particularly active during the last twelve months in announcing such plans. However, the establishment of such systems does not simply meet the demand for additional space but actually adds to it. The Center for the Study of Higher Education in Berkley, California, in a study

on the influence of different types of public institutions of higher education on college attendance, notes the impact which is generated by establishing junior colleges. Those communities with such colleges were the ones in which the highest percentage of high school graduates entered college. In particular, a higher percentage of those with high ability continued their education and a much higher proportion of those from a low socioeconomic status went on to college.

The 75 public junior colleges of California now bring 95 per cent of the population of that state within commuting distance of a college. These colleges enrol almost 60 per cent of the state's public college students.

The trend toward higher enrolments is not restricted to Canada and is equally as pronounced in the United Kingdom and in the United States. In France and Sweden enrolments are increasing even more rapidly than they are in Canada. Already the United States has a much higher percentage of the college age population in attendance at universities than is the case in Canada and therefore dramatic enrolment increases in that country would not normally be anticipated. Nevertheless, the 1964-65 enrolment at universities in the United States was 10.8 per cent higher than the preceding year with a total enrolment of 5,320,000 students.

In the United Kingdom the Committee on Higher Education under the chairmanship of Lord Robbins recommended an increase in the number of universities in that country from 32 in 1962-63 to about 60. These recommendations are already being acted upon and a number of new universities have been created in the United Kingdom since the publication of the report. In fact during the 20-year period ending in mid 1965 a total of 28 new universities had been established in the United Kingdom.

A number of Canadian universities have already announced elaborate plans or have embarked upon such plans in preparing for larger enrolments. The President of the University of Windsor foresees the possibility of that university tripling its 1964-65 enrolment of 2,000 students by 1970. Sir George Williams University has under construction a 24 million dollar fourteen storey building. This new building will permit growth of the present student body of 3,500 full-time students and 8,500 evening students to a total of 5,000 full-time students and 10,000 evening students. At Carleton University in Ottawa it is anticipated that enrolments will rise to about 6,000 students by 1970-71. It is expected that undergraduate enrolment on the present campus will have to be restricted by 1968 and that another campus in Ottawa will be required to handle the larger enrolments which are predicted.

York University with less than 800 students in 1964-65 expects to enrol 7,000 by 1970. The University of Toronto has launched a program of developing a system of satellite campuses to handle additional student enrolments. Other Ontario universities have similar plans for vastly increased enrolments by 1970, involving increases of the order of ten times during a five-year period in some cases. The University of Saskatchewan in Regina expects 8,000 students by 1972 while the University of Alberta in Calgary predicts increases of the order of 25 per cent a year in the immediate future.

In 1965 Canadian government bodies and officials stressed the need for additional expenditures on research and development and pointed out that Canada compared unfavourably with other industrialized nations. Increased emphasis on research and development in Canada would create greater demands than at present for the graduates of our universities.

The rising costs of education were reflected in higher tuition costs at many universities and colleges, and considerable attention was paid to this question during 1965. It is felt by some that higher tuition costs may reduce enrolments below anticipated figures which are required if needed graduation classes are to be produced. Some universities did not increase tuition costs as had been planned following provincial decisions to raise educational grants. In Newfoundland the government will now pay the tuition of all first-year students at Memorial University not already provided for by scholarships or other government grants and this may be extended to other years of study.

The Canada Student Loans Plan was also inaugurated during the 1964-65 academic year, and 41,000 students took advantage of it during the first year of operation.

Year Round Education

The year-round system of operation has come under considerable study during the past year and has been commented on in the report of the Royal Commission of Enquiry on Education in the province of Quebec and in the annual report of the University Grants Committee for Nova Scotia for the calendar year 1964. Actually graduate work has been on a year-round system of operation at many universities for some time with the summer semester being devoted primarily to research.

The University of Saskatchewan, to some extent, introduced year-round operation in 1957 with the establishment of a pre-summer school session starting in April and extending to the start of regular summer school. The University of Alberta is also considering the introduction of a similar split summer semester and already has in operation a full intersessional semester from May to September for graduate students.

Simon Fraser University, which opened its doors in 1965, plans on an enrolment of 7,000 students attending full-time by 1970-71. Simon Fraser University will be the first university in Canada planned with the view of operating all faculties on a trimester system. Variations of this approach have been used before at the University of Waterloo with considerable success, particularly in the Faculty of Engineering. At Simon Fraser University students may enrol at the beginning of any of the three semesters and may attend one, two, or three semesters a year. The faculty will lecture for only two semesters each year and may use the third semester for research and other purposes. To begin with, Simon Fraser will have only three faculties (Arts, Science, and Education).

In 1964 Mount Royal College in Calgary adopted the trimester plan of operation, and the newly established Wellington College of the University of Guelph commenced operations on a trimester basis in 1965 with courses of study leading to B.A. and B.Sc. degrees. The University of Manitoba has a special presidential committee studying year-round operations.

Perhaps the most significant developments in the trend toward the year-round operation of universities during 1965 were in the United States. Plans were completed in 1965 for the University of California to adopt the year-round program, joining three of the colleges of the State University of New York, all of the public institutions of Florida, and a number of other universities and colleges. In the fall of 1964 the University of Pittsburgh presented its first Ph.D. to a student who had taken full advantage of the trimester program adopted in the fall of 1959. The student completed a normal seven-and-a-half-year program from high school graduation in five years.

In Florida, the first state to place all public institutions of higher education on a trimester basis, a trimester high school has been established as the first unit of the South Florida Education Center in Fort Lauderdale.

Technological Aids

The use of technology to help alleviate shortages in teaching staff and to assist in the process of learning has become noticeable during recent years. Basically the objective can be described as threefold. Technological advances can result in a more effective use of teaching staff, more effective teaching methods, and a better utilization of the time which a student devotes to the learning or study process.

The use of closed circuit television as an aid to lecturers was studied by a committee of university teachers and administrators in Ontario, and in 1965 this group reported an expanded use of television in this way. The next step could be the sharing of facilities by different Ontario universities through exchanging video tapes or through direct cable or micro-wave connections. The University of Toronto's Scarborough

College will be the first academic institution in Canada built especially to accommodate television teaching methods. Other Canadian universities already using television are McGill, Toronto, York, McMaster, and the University of Alberta.

The use of television also came in for special mention in the Parent Commission Report in its assessment of how higher education should develop in Quebec. Closed circuit television was also tried out in the summer course in psychology at the University of Manitoba during 1965. This is the first attempt at Manitoba and, if successful, will probably become a regular feature in some of the larger classes.

The head of the department of industrial engineering at the University of Toronto in the journal of the Association of Professional Engineers of the Province of Ontario describes three potentially important characteristics of computer-assisted learning. These are: the teacher would be freed to devote his time to stimulating creativity and where necessary to devoting more time to the problems of individual students; the "computer-teacher" would treat each student on an individual basis, having full regard to his previous performance, and the "computer-teacher" has, potentially, the important characteristics of "immediate-response".

There is evidence that the computer will have an increasing influence at all educational levels. At the high school level, it may not be purely coincidental that the new approaches to the teaching of mathematics should follow the advent of the digital computer by less than 10 years. There are indications that computers may well be used directly in the role of advanced teaching machines. For example, if large scale time-shared computer centres could be established as a form of public utility servicing the schools, it might be possible to monitor directly the progress of individual students.

Computers are now being used in the development of teaching methods for linguistics, such as producing glossaries and concordances. The work being done at the University of Toronto in studying the Chinese language also utilizes computers. This method of discovery will likely have important implications for the whole science of linguistics.

Mechanical aids will also make information retention and research a great deal simpler. The linking up of medical libraries in the United States is an important pioneering development in this field and is described more fully in the section on library science.

A system somewhat similar to this is being used in various centres in the United States in the field of law. Computers now can hunt through case and statute books on magnetic tape and electronically sort out precedents and pertinent laws. The speed and scope of computer searching provide an economical tool to draft new laws. New York State will use a computer to aid legislators on recodification.

Graduate Studies

It has been noted that the number of persons obtaining graduate degrees is increasing more rapidly than those obtaining first degrees, and furthermore the rate of increase of graduate degrees awarded each year is accelerating faster than that for first degrees. This trend would appear to be definitely established for at least the next few years since the same phenomenon can be observed when one looks at enrolment statistics.

Although there was about a 17 per cent increase in the number of graduate degrees awarded between 1964 and 1965, as compared with a 14 per cent increase in the number of first degrees awarded, the enrolment comparison is even more dramatic. During the year undergraduate enrolment increased by about 11 per cent while graduate enrolment increased by 25 per cent. During the year ending in 1963, there was about a 9.5 per cent increase in undergraduate enrolment and a 15 per cent increase in graduate enrolment. Graduate students constituted 7.2 per cent of the total enrolment in 1964-65 compared with 5.9 per cent in 1962-63 and 4.5 per cent in 1956-57.

The smaller faculties and schools of graduate studies are growing more rapidly than the larger ones. However, the University of British Columbia recorded more than a 20 per cent increase in graduate enrolment between 1963-64 and 1964-65 to a total

of 1,100 students. This figure is twice that enrolled four years earlier but only one quarter the 4,000 graduate student enrolment predicted by the Dean of Graduate Studies for five years later in 1970. The 1970 prediction would mean that 20 per cent of the 1970 U.B.C. student body would be in graduate studies compared with about eight per cent in 1965. It is felt at U.B.C. that less than one fifth of the students capable of earning doctorates now enrol in graduate work.

At the University of Alberta the Faculty of Graduate Studies increased its enrolment by six times to a total of about 1,200 students between the 1957-58 and the 1964-65 academic years. The Dean of Graduate Studies states that it is the intent of the University to develop the graduate program as fast as it is possible to provide space, facilities, and finances. During the year ending in 1964 over 4,000 potential graduate students inquired about studies at the University of Alberta and the number inquiring during 1964-65 is expected to be a third higher again. The enrolment of graduate students would have been at least 50 per cent higher in 1964-65 if there had been sufficient space and facilities.

In describing what is happening to graduate studies at McMaster University the word "exciting" has been used. There has been a sharp increase in graduate student numbers over the past years, and an additional 30 per cent is anticipated in 1965-66. It is expected that all departments at the University will soon be offering graduate work at the doctoral level.

Dalhousie University is planning on enrolment increases of about 30 per cent each year in the immediate future and had to make an upward revision of its 1961 forecast in 1963. The Dean of Graduate Studies feels that another upward revision from the 1963 forecast may now be necessary. It is anticipated that within five years a third of the graduate students will be working towards the Ph.D. compared with a quarter in 1965.

The newly established Faculty of Graduate Studies at the Calgary campus of the University of Alberta increased its enrolment of full-time students from 60 during the 1963-64 academic year to 117 in 1964-65.

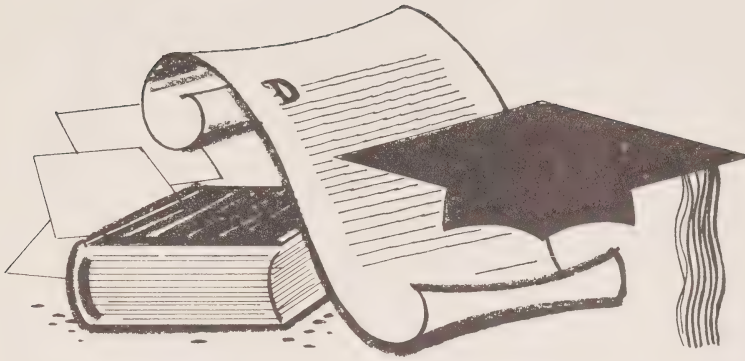
Throughout the country there is a pronounced emphasis toward increasing not only the proportion of students enrolled in graduate studies but also the proportion of those working toward doctorates. It is interesting to note that enrolments reported by different universities at the post-doctoral level show even more dramatic percentage increases from year to year than those recorded at the doctoral level.

There is, however, a marked concentration in the fields of study in which doctorates are awarded. Tables three to seven of the appendix illustrate this clearly. The two broad disciplinary fields of chemistry and the mineral sciences accounted for 60 per cent of Canada's production of Ph.D. degrees in 1965.

Acknowledgements

This year, a much higher percentage of those contacted responded than in any previous year. In all, a total of 87 replies were received from contributors. These contributions came from professional associations, individuals, institutions of higher education, and other organizations. It would not have been possible to produce this booklet without their help, and whenever possible references to the sources of information are made in the text.

Particular reference, however, must be made to the Education Division of the Dominion Bureau of Statistics and to the Pay Research Bureau of the Civil Service Commission. These two organizations were involved in the surveys which produced much of the statistical information contained in the following pages.



AGRICULTURE

THE future is bright for the professional agriculturist with the demand for his knowledge and services rapidly increasing. The chairman of the department of agronomy at Macdonald College reports that the number of people in primary agriculture has been declining and will continue to decline, while the number of people in professional agriculture and all its associated disciplines has increased tremendously. Anticipated graduation figures for 1966 show an increase of just over 15 per cent.

Requirement studies conducted by the Department of Labour suggest that Canada will need an increase of 40 per cent in graduating agriculture students in the next ten years and that of this number 35 per cent should undertake graduate studies. Some concern has been expressed by various agricultural faculties about the small number of graduates going on to higher degrees. The Dean of the Faculty of Agriculture at the University of Alberta points out that because of the scarcity of Canadians with graduate degrees in the agricultural sciences, the research branch of the Canada Department of Agriculture, as well as a number of other employers of such specialized graduates, have not been able to employ Canadians with the qualifications that the employers desire. The 35 per cent figure suggested by the Department of Labour seems to indicate, however, an increasing trend to graduate study in the field.

To meet the increasing demands for further training in the field of food science and technology, the University of British Columbia has instituted a program leading to the Master's degree in food science. The prerequisite to this course is the Bachelor's

degree in food science or in acceptable courses in fields of study related to food science.

At Laval University the construction of a six million dollar agriculture building will be completed for the 1966-67 academic year. This is now the only French language agriculture faculty in Quebec since the schools at Oka and St. Anne de la Pocatiere were closed and merged with that of Laval. The new building will be able to accommodate 650 students and studies may be continued to the Ph.D. level.

A wealth of job opportunities are now open to the new graduate due in part to the large increase in the number of specialized industries serving agriculture. Government agencies and the universities are undergoing considerable expansion in their agricultural services and thus offer many new openings particularly in the field of research. Some commercial firms employing agricultural graduates for the first time are finding such employees especially suitable, because the broad basis of science and economics in agricultural programs enables these graduates to be particularly adaptable. Firms having a large volume of business with farm customers find it advantageous to employ agricultural graduates who can do much to ensure the right product and its correct usage by and for such customers.

In industry, employment is available in the processing and manufacture of food, grain, feed, seed, and fertilizer. Agricultural engineering graduates may find employment in the farm machinery industry.

The University of Saskatchewan reports that each year a number of graduates find employment on farm newspapers and publi-

cations, in market reporting, and in agricultural advertising. Resource development — such as conservation, utilization and development of renewable resources, flood control, irrigation projects, and soil surveys — is another field in which agricultural graduates find employment.

The Agricultural Institute of Canada states that the scientific advances in agriculture and their application to farming require a much higher level of education than was thought necessary in the past. In the United States in 1959 the top three per cent of farmers in terms of income produced 30 per cent of the total value of agricultural products; the bottom 44 per cent produced only 5.3 per cent. These top-level farmers also demand more and more research information.

The curriculum in agriculture at the university stresses a strong background in the basic sciences. The advances in agriculture have come from an understanding of the sciences in their relation to agriculture and an application of scientific principles to the problems of agriculture.

With the increasing number of Canadian farms employing land, livestock, machinery, and buildings having a value of one hundred thousand or more dollars, there is a growing need and demand for farm operators and farm managers with a university degree in agriculture. In some provinces upwards of 20 per cent of the graduating students are becoming operators or managers of farms, the University of Alberta reports. The trend in this direction is expected to become stronger as farm size and capitalization continues to increase.

The growth of farm size has also brought about the use of consultants in Canadian agriculture. Independent consulting services are expected to expand fairly rapidly and to offer attractive opportunities to graduates.

ARCHITECTURE

THE Ontario Association of Architects states that not only is there a serious shortage of trained architects today, but that the number of young students taking up the profession is far short of the requirements for construction in the future. The current shortage in Ontario is estimated at 400. However, projections for 1966 indicate a

20 per cent increase in the number of graduates over the figures for 1965.

The Royal Architectural Institute of Canada reported 2,613 architects registered with provincial associations in 1964. This was a ratio of 18.8 registered architects per 100,000 urban population as contrasted with a ratio of 13.9 in 1951. For comparison, the number of architects in the United States in 1950 was 21.5 per 100,000 urban population.

Architectural schools at McGill and at the University of Manitoba both report excellent employment opportunities and a steady demand for graduates as a result of the rapid expansion of industry and commerce in Canada.

Canada now possesses seven schools of architecture, each fully equipped to meet the demands of the profession (British Columbia, Laval, Manitoba, McGill, Montreal, Toronto, and Nova Scotia Technical College). Graduate work is becoming more popular as well as necessary as Canada's program of construction and rebuilding gains impetus. Further study generally takes the graduate architect to the United States, France, or the United Kingdom, although each year more graduate work is undertaken in the Canadian schools, particularly in the area of civic design as well as the problems of urban redevelopment.

Most architectural graduates enter practice with an established firm, before starting practices of their own. Good employment opportunities also exist in the offices of government and industrial concerns.

Starting salaries are generally good and have improved considerably in the last few years.

Interior Design

A small group of graduates in interior design is available each year, with a steady demand for their services.

Though the University of Manitoba is the only Canadian university offering a degree, the student body is drawn from all parts of the country, and the graduates spread across Canada, being located in all major cities from Halifax to Vancouver.

The majority of graduates in interior design are drawn into the commercial field.



They are employed by architects; on the staff of interior design firms or interior studios of department stores; in the planning departments of stores or hotel chains; in office planning and supply; in contract sales departments, and with restaurant suppliers. A limited number of graduates enter the teaching profession in the specialized fields of high school art and university applied arts departments.

The field is open to both men and women, and professional organizations exist in Quebec, Ontario, Manitoba, Alberta, and British Columbia.

ARTS and SCIENCE

INCREASES in 1966 graduating classes over those of 1965 are predicted in all areas of honours arts and science and range from as low as three per cent to as high as 50 per cent. The overall increase in honours graduates is about 12 per cent compared with about 10 per cent for graduating classes with pass degrees.

An honours arts degree provides an excellent basis for a wide variety of career opportunities including teaching, welfare work, and administrative jobs. Professional qualification in most areas of arts study, however, usually necessitates an M.A. or Ph.D. degree.

In a YMCA symposium held in Vancouver in 1965 it was predicted that all YMCA permanent staff would be university graduates in the future and that there was a special need for graduates with social science degrees.

The greatest number of job opportunities for graduates from the various social science specializations exist in government service. Government agencies employ about half of the personnel in the fields of economics, sociology, and statistics.

The largest number of honours graduates, about 17 per cent, is in the field of modern languages and literature, and the size of this graduating class is increasing at a slightly faster rate than the total of all honours graduates. In the field of linguistics the Dean of Engineering at the University of Saskatchewan foresees considerable development during the next few years through the additional use of mechanical aids. Already a vast body of information,

both about the structure of languages in general and about the Russian language in particular, has emerged. In particular computers are serving linguists in producing glossaries (words in frequency of text occurrence) and concordances (defining places of occurrence in the text).

Good employment opportunities exist for graduates with either a Bachelor's or Master's degree in science, but full professional qualification for a scientist usually involves possession of a Ph.D. degree. The tendency of students to proceed to graduate study rather than to enter the labour market upon graduation from a Bachelor's course has been growing steadily in the past few years.

The continuing growth of industry, the development of research, and rising university enrolments have created a strong demand for physical science graduates, a demand that can be expected to continue for some time. Qualified personnel to teach at the university level are perhaps most in demand, and graduates interested in such a field should pursue their studies to the Ph.D. level.

A great deal of activity is going on at Canada's universities both in the expansion of facilities and of courses offered by the universities. This activity is brought about both by the increased interest upon the part of students in the fields of the arts and sciences and by Canada's growing awareness of the need to ensure a continuing supply of qualified people, particularly scientists, in future years.

Construction on a new social sciences building on the Edmonton campus of the University of Alberta was set for the fall of 1965. The building is slated for completion in 1967. It will accommodate 5,000 students and will provide facilities for the archaeology, history, philosophy, sociology, political economy, meteorology, political science, and geography departments. The University of Western Ontario has announced plans to open a college of science this year. This represents a reorganization of the Faculty of Arts and Sciences and is designed to keep numbers in the faculties at an efficient teaching and administrative level. The college will include departments of botany, zoology, geology, geophysics, chemistry, computer science, mathematics, and astronomy.

York University in Toronto plans a number of interdisciplinary research centres and will start this year with a Centre for Research in Experimental Space Sciences. This will be followed by centres in molecular science, material science, and so on, which will provide facilities where physicists, chemists, biologists, and other scientists can work together on problems of common interest. York is operating on the theory that the borderlines between the classical disciplines are rapidly disappearing and that many major advances are being made in the overlapping areas. Departmental structure will therefore be replaced at the graduate level by interdisciplinary research centres.

Interdisciplinary graduate study is also being planned by the University of New Brunswick in the departments of English, history, economics and political science, and romance languages. The plan is to institute a program in North American studies, crossing departmental lines for both course work and research. At the University of Toronto a new diploma program is now in operation in Russian and East European studies, taken in conjunction with an M.A. degree in one of several disciplines. Doctoral work in Slavonic studies is being inaugurated at the University of British Columbia.

The honours degree normally precedes graduate work, and the increasing demand for graduate degrees has a direct bearing on enrolments in honours courses. It is interesting to note the recent trend toward honours programs in the United States. The *National Education Association Journal* reports that more than half the current honours programs have been inaugurated since 1960. Approximately 40,000 students were enrolled in honours programs during the 1962-63 academic year at 334 universities and colleges in the United States.

Arts and Science (Pass and General)

There is expected to be an increase of approximately 10 per cent in the number of graduates with pass or general degrees in arts and science during 1966, compared with a 14 per cent increase in 1965 over the number graduating in 1964.

A wide variety of occupations in government, business, and industry are available to graduates from the various pass arts and science courses. Research, sales, adminis-

trative, as well as other types of positions, all require an increasing number of personnel. Graduates at the Bachelor level, particularly in arts courses, are generally employed as junior executives, to be trained for later promotion to executive positions.

There is also a constant demand for graduates in the sales field, with excellent opportunities for pass science graduates as sales representatives for pharmaceutical and chemical firms.

Because of the continuing need for teachers at the secondary school level, pass arts and science graduates are still in demand as potential teachers, generally following a period of teacher training.

One specific area in which the demand for graduates has shown an appreciable increase is the electronic data processing field.

The chairman of the education committee of the Computing and Data Processing Society of Canada estimates that employment opportunities increased more rapidly from 1962 to 1964 than they did from 1960 to 1962 when they tripled. Graduates with a strong background in mathematics and some experience in programming and numerical methods or statistics should be able to find good career opportunities in this field.

The accounting profession is also opening up to pass arts and science graduates, as a number of firms are beginning to employ such graduates as students-in-accounts. The year 1970 has been set as the time when a university graduation will be required before a person can start studying chartered accountancy. The Canadian Institute of Chartered Accountants recognizes that at that time the major supply of students will come from those studying in disciplines other than commerce, such as arts and science. The Institute of Chartered Accountants of Ontario states that non-commerce graduates presently represent one half of the Ontario graduate intake, and there are very active attempts to recruit the non-commerce graduate.

Many pass arts and science graduates use the Bachelor's degree as a stepping stone to a professional degree in such fields as law, social work, library science, or medicine.

Well-qualified pass graduates in either arts or science can expect fairly good salaries and a slight increase has been noted from 1964 to 1965.

Biological Sciences

A seven per cent increase in the number of biological science graduates in 1966 is forecast, compared with a 10 per cent increase in 1965.

The continuing emphasis on research plus the growth in the number of universities and the expansion of present ones combine to make the employment outlook for the new graduate a bright one.

The largest number of opportunities for employment are offered by the federal and provincial governments. Such departments as Agriculture, Fisheries, Northern Affairs, and Health and Welfare in the federal system, and the departments of Health, Agriculture, and Lands and Forests in the provincial governments offer career opportunities to the biological science graduate.

Due to the growing student population and the expansion of educational facilities, universities, colleges, and secondary schools require a great number of teachers in the science field, with perhaps the greatest need being at the high school level.

The Memorial University of Newfoundland this year began construction on a major marine sciences installation to include a running sea-water system permitting maintenance of marine flora and fauna for experimental studies and observations. This new marine sciences laboratory has been designed to encourage a greater range of studies in marine biology at Memorial and in Canada generally.

Two thirds of the biologists in Canada now hold graduate degrees, and more graduates each year are going on to advanced degrees in their respective fields.

Medical laboratory science degrees are offered at the University of Alberta (Edmonton) and at the University of Saskatchewan. Diploma courses are given at the University of Montreal and Laval University, while the University of British Columbia offers extension courses in advanced medical laboratory technology. Employment opportunities for university graduates are chiefly in the larger centres, in the research labora-

tories of universities and large hospitals. This applies mainly to graduates with specialization in bacteriology and biochemistry.

Salaries in the biological sciences continue their upward trend, showing a slight rise over the 1964 figures.

Chemistry

The Dominion Bureau of Statistics reports that the physical output of Canada's chemistry industry rose by seven per cent during 1964. As a result of this expansion in the chemical and process industries, there is a shortage of chemists now that is likely to continue for some time.

Employment may be found in a wide variety of fields starting with work in federal government research projects in the chemical aspects of nuclear energy, fisheries, forest products, agriculture, food and drugs, and national defence as well as in the pure and applied research programs conducted by the National Research Council.

In a symposium sponsored by the Chemical Institute of Canada for the placing of honours chemistry graduates in industry, J. A. Page of the University of Toronto pointed out that the university is a place where students are trained specifically for pure scientific research. Honours graduates should never be recruited for quality control laboratories but should proceed to graduate studies, stated Dr. Page. If this policy is followed in future years, very few honours graduates in chemistry will be available for industry.

There are opportunities for honours chemistry graduates as science teachers in secondary schools, and graduates possessing Ph.D. degrees are in demand to handle the rapidly increasing enrolments at universities. A Ph.D. degree is usually required of those wishing to enter industrial or government laboratories as research chemists.

Chemistry graduations in 1966 are expected to increase by about five per cent which is considerably less than the 17 per cent experienced in 1965. Graduations at the doctoral level consistently exceed the number graduating during preceding years with a Master's degree. This is attributed in part to the number of those obtaining Master's degrees in chemical engineering, followed by a Ph.D. degree in chemistry. Graduation statistics relating to higher



degrees are contained in tables three and four of the appendix.

Salaries for chemists at all educational levels — Honours, Masters, and Ph.D. — have shown a considerable increase over the 1964 figures.

Economics and Political Science

Graduating classes in economics and political science are expected to be 18 per cent higher in 1966, compared with a 10 per cent increase in 1965. This trend to larger graduations in these areas has been continuing for several years.

Carleton University has announced the establishment of graduate studies in international affairs, with classes to begin in the fall of 1965. The school will offer a program of advanced studies leading to the Master's degree for persons preparing for careers in government, universities, business, journalism, and other fields. The curriculum will be based on an extensive list of courses in international affairs already being offered at Carleton in the departments of political science, history, economics, geography, and public law. An expanded program of teaching and research in the area of Soviet and East European studies is also under way at Carleton.

A four-year honours program, the first of its kind in Canada, in French and political science is to be introduced at the University of Waterloo this fall. The acting chairman of the department of political science reports a growing need in Canada for graduates who can apply a knowledge of the traditional arts to special national conditions and who are proficient in both French and English.

The best employment opportunities for political science graduates exist in government service. Graduates may also find employment in teaching, in research, or on the staffs of newspapers or radio and TV stations.

Economists too will find their best career opportunities in Canada's federal government. People trained as economists and statisticians are especially needed to carry out the many surveys and studies now being undertaken by various government departments.

Graduate training is a definite asset to graduates in both economics and political

science. As in most other disciplines, the Ph.D. degree is a necessity for teaching at the university level.

The trend toward separating economics and political science became more noticeable during 1965 with the creation of separate departments for the two fields at a number of universities.

Salaries in this field have shown a considerable jump over those offered to 1964 graduates.

Geography

Canada is considered to be one of the world leaders in the professional training of geographers. In 1964-65, 60 Ph.D. degree candidates in geography were registered at six Canadian universities (British Columbia, Manitoba, McGill, Montreal, Ottawa, and Toronto), while close to 400 students were registered in honours geography courses at seventeen universities. The Canadian Association of Geographers reports that the increase in enrolment since 1960 has been more than 100 per cent, reflecting the growing interest in geography and the great demand for geographers with advanced qualifications at the present time. Information collected by the Association suggests that this trend will continue through the latter part of the 1960's.

The qualified geographer should have no difficulty in finding employment. There are a large number of vacancies in high school teaching for those with an honours degree. The head of the department of geography at the University of Western Ontario reports, in fact, that more than half of each year's honours graduates teach at the secondary school level. Many universities and government departments have unfilled positions because of the lack of geographers with higher degrees. The Canadian Association of Geographers estimates that of the students who obtain higher degrees in geography in 1965, approximately 40 per cent will enter university teaching, 30 per cent will be employed by federal and provincial government departments, ten per cent will become school teachers, and the remainder will find employment in a variety of positions ranging from market research to historical cartography.

Salaries in the universities and the civil service for geographers are comparable to those in other disciplines.

Mathematics

Canadian universities expect to graduate about 180 honours students in mathematics in 1965 compared with 120 in 1964. A further increase of 28 per cent is forecast for 1966. This continues the trend noticed in the past few years when there were increases of 13 and 22 per cent in 1962 and 1963 respectively. The majority of Canadian universities offer courses at the honours level in mathematics and twenty offer graduate work.

The demand for mathematics graduates continues to be quite strong. The Department of Labour estimates that the number of mathematicians in employment will increase by 11 per cent annually for the next few years.

Employment is available to mathematicians in industry, in government service, and in the teaching profession. Other avenues of employment are in the computer field and in the electronic processing of accounting and business information.

Employment opportunities as programmers are about equally divided between those with a Master's degree in mathematics or computer science and those with a Bachelor's degree in honours mathematics, mathematics and physics, or in applied science. A mathematics graduate must have first class standing or actual experience in programming and some other areas such as statistics or accounting, states the chairman of the education committee of The Computing and Data Processing Society of Canada. Some 60 per cent of mathematicians are engaged in teaching, two thirds of them at the secondary school level.

The actuarial field is a growing area in which the new graduate may find excellent employment opportunities. The rapid growth of the insurance industry has resulted in a marked shortage of qualified actuaries, states the Canadian Association of Actuaries. There are many openings for actuaries in insurance companies, and the increasing numbers of pension plans for business and industry have created many opportunities in the various firms of consulting actuaries, in industry generally, and in government. Many Canadians find employment as actuaries in the United States further aggravating the shortage here. Laval, McGill, Queen's, Toronto, Waterloo, Western On-

tario, Manitoba, and British Columbia offer courses in actuarial science.

Competition among employers for graduates in mathematics is reflected in the increase in starting salaries over those offered 1964 graduates. Starting salaries tend to be somewhat lower for Bachelor graduates than for other science disciplines. However, starting salaries for those holding higher degrees generally exceed those offered for other science disciplines.

Physics

There exists today an almost unlimited number of openings for physicists in industrial or government laboratories, in university work, or in meteorology, and there is as well an unlimited demand for qualified secondary school physics teachers in Canada. At the present time, far more secondary school specialists in mathematics and physics are retiring than are being graduated from the various schools of education.

One half of Canada's professional physicists are employed in government service, and most of these are with the Defence Research Board, Atomic Energy of Canada Limited, or the National Research Council. A number of opportunities are available in industry in the fields of electronics, data processing, metal refining, oil prospecting, communications, and power development.

Each year a number of graduate physicists enter the fields of astronomy and meteorology. Agencies of the federal government are the major employers of graduates seeking specialization in these fields. Honours graduates in mathematics and physics, physics, or engineering physics are employed by the Meteorological Service of Canada. During their first two years of employment with the Service, graduates are required to attend, for two academic sessions, the Master's degree course in meteorology at the University of Toronto or McGill University.

The qualification for teaching at the secondary school level is generally an honours degree in physics, while a graduate degree, preferably a Ph.D. degree, is required for teaching at the university level. A graduate degree is virtually essential for advancement in the profession as more than 60 per cent of Canada's physicists have such qualifications.



Psychology

Opportunities for professional employment in psychology in Canada are encouraging and are likely to remain so. Employment opportunities have increased more rapidly in the past twenty years than the increase in graduations, producing a widening gap between available jobs and the supply of qualified graduates. The Guidance Centre of the Ontario College of Education reports the greatest excess of demand over supply to be in the applied fields, especially clinical psychology.

Child guidance and public mental health clinics have been, and still are, short-staffed because of the lack of qualified clinical psychologists. Industrial consultant firms frequently advertise for several months before finding suitably trained psychologists. The present demand for psychologists on the teaching faculties of universities is not as extreme as it is in other fields. However, the projected increases in university student enrolments will result in an upsurge in the demand for qualified personnel to fill teaching and research positions.

Mental hospitals, universities, and clinics employ the largest number of psychologists, but there are many other avenues of employment open to those who are professionally qualified. Industry is now turning to the psychologist in the selection, training, and placement of personnel.

Some psychologists practice independently, usually as clinical, vocational, or industrial consultants. A number of psychology graduates enter government service, usually in the fields of personnel, clinical, or research work.

Adequate training in psychology has been found to be desirable in those who give educational and vocational guidance in the secondary school system, and some psychology graduates find rewarding employment in this field.

A small increase of just over three per cent is anticipated in the 1966 graduating class in honours psychology. Most Canadian psychologists now hold the M.A. or Ph.D. degree, and each year the number of doctorates increases. The Ph.D. degree is already required of most Canadian university professors of psychology.

More than twenty Canadian universities offer graduate studies leading to either the

Master's or the Doctor's degree in psychology, and the University of Manitoba reports having added the Ph.D. to its program in the last year. Waterloo Lutheran University has tentative plans to begin a Master's program in psychology in the 1966-67 academic year.

Salaries for psychology graduates show a great variation because of the many activities in which psychologists engage, but they are found to be generally high.

Sociology

The growing interest in the study of sociology is indicated in the more than 50 per cent increase anticipated in the 1966 graduating class in this discipline. This continues the trend resulting from heavy enrolments in sociology recorded in the past five years.

About eighteen university sociology departments now offer graduate studies in this field, six of which are at the Ph.D. level. St. Francis Xavier University is now studying the possibility of offering a Master's degree in community development in adult education, while the University of Montreal plans to offer a Doctorate in Criminology.

Graduates may find employment in the teaching profession, particularly at the technical, secondary, and university levels, as well as in teacher-training institutions. The services of sociologists are now in greater demand in government service, especially for work in social and economic research branches. A number of large private firms in industry and commerce now employ sociologists to conduct various staff studies, and employers' associations, workers' unions, and professional groups offer positions to sociology graduates in research work and analytical studies.



Private research agencies also employ sociologists to study such areas as population shifts and market trends.

Salaries for sociology graduates are gradually increasing and will doubtless go higher as the services performed by sociologists become better recognized.

COMMERCE and BUSINESS ADMINISTRATION

GRADUATES in commerce and business administration today have a very wide choice of career opportunities. The Dean of the School of Business at Queen's University reports that in addition to the more traditional avenues of accounting, sales, advertising, and personnel work, graduates in these fields find employment as trust officers, investment analysts, in market research, in banking, and in government service as junior administrative officers.

Graduates from an honours commerce course go forth to many varied careers. Some continue their studies to become lawyers or to teach at the university level, and some become secondary school teachers. A fair number of honours graduates go into business to pursue careers in management.

A four-year degree program in commerce, unique in Canada, will be offered in the fall of 1965 by the University of Alberta at Calgary. The program will be offered in three sequences emphasizing management science, industrial administration, and accounting and finance.

A new College of Public and Business Administration is to be established at the University of Saskatchewan's Regina campus. The Dean of Arts and Science at the Regina campus states that the programs of the new college will both supplement and complement those at present offered by the College of Commerce at Saskatoon. McMaster University reports a 60 per cent rise in new admissions in 1965 to its Master of Business Administration course. Graduates in arts, science, engineering, pharmacy, commerce, law, and agriculture are among those eligible to study for the M.B.A. degree.

Thirteen Canadian universities offer graduate study in commerce and business administration, three of which are at the

Ph.D. level. These are Western, Montreal, and Laval.

The School of Business at Toronto University reports that its graduates with the M.B.A. find employment in finance, marketing, personnel, and operations analysis. The school suggests also that M.B.A.'s represent a pool of manpower that seems to be very attractive to many firms. Queen's School of Business offers the opinion that there is a very heavy demand for graduates in engineering, arts, and so on, who have proceeded to the M.B.A. degree. Furthermore, the number of graduates in business administration, both at the first degree and graduate level, is increasing. The demand for people with this type of training much exceeds the supply and shows a tendency to go up substantially each year.

An 18 per cent increase in graduations in 1966 of commerce and business administration students is forecast.

Accounting

Where the Canadian Institute of Chartered Accountants once looked for only commerce graduates as students-in-accounts, their emphasis is now to seek those from other faculties, i.e., arts, engineering, law, and science. The Institute of Chartered Accountants of Ontario reports that non-commerce graduates represent about one half of the graduate intake into accounting firms.

The University of Saskatchewan continues to carry their combined B. Com.-C.A. program which grants both degree and diploma within a six-year period by service in the profession and study at the university. Four Quebec universities are now offering the Licentiate in Accountancy, the possession of which gives the right of admission to the Institute of Chartered Accountants of Quebec without further examination. The four schools which offer this course are McGill, Laval, Montreal, and Sherbrooke.

The required course of study that C.A. students must follow and the examination that they must write vary from province to province. There are ten provincial Institutes of Chartered Accountants responsible for determining what the course of studies will be. The Canadian Institute prepares the examinations used by the provincial organizations.



Chartered accountants may work as public accountants thereby offering to the public professional services in auditing and accounting, or they may occupy positions in industrial, commercial, governmental, and academic organizations. At present about half the chartered accountants in Canada are practising as public accountants.



EDUCATION

THE organization of education in Canada continues to change rapidly in all provinces. These changes range from the decision by Prince Edward Island to amalgamate St. Dunstan's University and Prince of Wales College into one provincial university to the decision by Ontario to create a network of junior colleges throughout the province. The decision of Prince Edward Island and Manitoba to bring education under the jurisdiction of universities increases to seven the number of provinces which now have all teacher training under the control of universities.

The recommendation of the Royal Commission of Enquiry on Education in Quebec that the 150 normal schools now in operation be abolished and teacher training be confined to the universities would add an eighth province to this total. Certainly the changes in Quebec are particularly dramatic at this time. Following the creation of a Quebec Department of Education the province has proceeded quickly to the bringing together of the 1,500 school commissions into 55 regional groups.

New Brunswick has announced the establishment of a bilingual teachers' college at the University of New Brunswick, and Saskatchewan will be granting its first education degrees in 1966 at the Regina campus of the University of Saskatchewan.

Throughout Canada there is an increasing demand for teachers at all levels. This

demand is produced by the increase in the number of students brought about by population growth and the trend toward longer schooling, as well as by the high attrition rate of teachers. One result of longer schooling is the changing ratio of teachers to population. The Dominion Bureau of Statistics reports that during the ten-year period from 1951 to 1961 this ratio changed from one teacher for every 43 head of population between the ages of five and 24 in 1951 to the ratio of one to 35 in 1961. In 1941 it was one to 48.

The Canadian Teachers' Federation reports the net increase in staff recruited by provinces during the summer of 1963 ranged from a low of 17 per cent to a high of 44 per cent. The attrition rate in all provinces was greater than 50 per cent of the additional staff recruited. Throughout Canada there has been an increased tendency for school boards to range further and further afield in recruiting not only newly graduating teachers but teachers presently employed in other provinces.

The Canadian Education Association, summarizing the situation, states that the deficiency of teaching personnel is still serious in secondary schools and critically acute in universities. However, in elementary education the main concern now is one of improving the qualifications of teachers and not simply one of obtaining additional staff.

Throughout Canada the trend toward upgrading teacher qualifications is becoming more noticeable. Illustrative of this is the report by The New Brunswick Teachers' Association that more teachers are obtaining university degrees and more candidates are pursuing degree programs prior to their entry into teaching.

Elementary

In most of Canada the shortage of elementary teachers is a problem of the past, and the Canadian Education Association suggests the major concern now is one of improving the qualifications of teachers and the quality of teaching.

The Provincial Association of Protestant Teachers' of Quebec reports that, as a result of the rapid increase in the number of candidates entering teacher training institutions in the last few years, the supply of teachers with either one or two years of

training has reached and even outstripped demand in many areas of Quebec. The Department of Education in Quebec ended the one-year course in June, 1965. All student teacher candidates must now take a minimum of two years of training. The Association of Protestant Teachers' feels that it would seem likely that the holders of diplomas requiring two years of training will also find a noticeable lessening in the demand for their services, unless extra training has been acquired in an elementary level specialty. The four-year Bachelor of Education course is becoming increasingly popular in Quebec as a preparation for both elementary and secondary level positions. The Association's Parent Report study group is in agreement with the recommendation which would require a Bachelor's degree for teaching in the elementary school.

In Ontario only the two teachers' colleges training teachers for bilingual schools now give the two-year elementary school training course for grade 12 graduates. The two-year course was discontinued in the fall of 1965 at the other colleges and only the one-year course for grade 13 graduates is now offered. A committee has also been appointed in Ontario to study teacher training programs in that province and to suggest an improved program for elementary school teacher training. The Canadian Education Association predicts a surplus of elementary teachers in Ontario by 1970 even with the upgrading of entrance requirements. In the past, approximately 15 per cent of the grade 13 students in Ontario found their way to teachers' colleges. If this same percentage applies in 1970 when grade 13 enrolments are expected to be at an all-time high, a surplus of elementary teachers is likely to exist.

The Ontario Teachers' Federation reports that there is an increasing requirement that elementary school teachers have university degrees, and the Federation has recommended a university degree as a minimum qualification for entrance to a teachers' college. In the past decade seven new teachers' colleges have been constructed in Ontario, and it is noted that these are located on or adjoining university campuses.

The British Columbia Teachers' Federation reports that the desirability of a degree qualification at the elementary school level

is receiving increasing recognition. However, fewer than 400 out of 1,300 newly certificated teachers produced by British Columbia universities each year have completed a Bachelor's degree. Thus, the Bachelor graduates from British Columbia universities are barely sufficient in number to staff the new secondary school positions which result from increased enrolment, without taking account of dropouts in the secondary staffs and without providing any Bachelor graduates for elementary school positions. The imbalance between supply and demand is likely to be aggravated over the next few years with the establishment at a number of British Columbia centres of junior colleges, and with the rapid expansion of British Columbia universities. There will inevitably be a considerable drain of the best qualified teachers from the secondary schools to the new colleges and to the university, and this will make it increasingly difficult to recruit teachers with degrees for elementary schools.

The Alberta Teachers' Association suggests a shortage of well-qualified teachers and states that the teacher shortage appears to be most acute in the elementary grades of the urban centres. The Manitoba Teachers' Society reports that the supply of teachers at all levels is not meeting the demand but that the situation at the elementary level is better than that at the secondary level where there is a pronounced shortage of teachers. In 1965 Manitoba brought all teacher training under the control of the University of Manitoba rather than the Department of Education. Teacher training is now under the control of the universities in all four western provinces.

Secondary

One of the developments which could affect the supply and demand situation at the secondary school level is the trend throughout Canada toward the establishment of junior colleges. The Canadian Teachers' Federation, commenting on the plans of the province of Ontario, feels that these institutions will undoubtedly create a strong demand for highly qualified personnel of the calibre presently teaching at the upper secondary school levels or in the lower university levels.

Similar viewpoints have been expressed relating to the plans in Quebec and British



Columbia for the establishment of junior colleges or similar institutions.

Areas of specialization in secondary school teaching are receiving increased attention throughout the country. The Manitoba Teachers' Society reports that to keep abreast of constant revisions in subject curricula and new developments in methodology requires most teachers taking refresher courses and participating in in-service training seminars a number of times throughout their careers. The Manitoba Teachers' Society reports a shortage of degree teachers throughout the province, especially in the fields of guidance, physical education, and technical vocational education.

Describing the Saskatchewan four-month internship for secondary school teachers, the Dean of Education at the University of Saskatchewan said that it was designed for those students who had already acquired an undergraduate degree and were not entering a full year of professional education leading to initial certification. All of these students intend teaching at the high school level. Students entering the diploma program for high school teachers must have a concentration of four university classes in one subject and two classes in some other teaching field.

In Quebec the Provincial Association of Protestant Teachers' were in agreement with the Parent Commission recommendation that all secondary school teachers must have a specialization in addition to a university degree. The Association of Protestant Teachers' reports that the demand for secondary school teachers with university degrees continues high and the demand is particularly high for subject matter specialists of all kinds, as well as for specialists in the service fields of guidance, remedial teaching, librarian, and audio visual experts.

A survey conducted by Professor Miles Wisenthal of Macdonald College and reported on in the *Teachers' Magazine* shows that a large number of high school teachers in Quebec are teaching subjects in which they have no university preparation. More than half of the teachers of geography and more than 40 per cent of those teaching French have no university preparation in those fields. Approximately 25 per cent of the teachers of mathematics, history,

Latin, and biology have taken no university courses in their teaching fields. Professor Wisenthal says that the high schools have by tradition depended on the universities to supply graduates of the kind and in the number they require. It has been quite apparent for some time that the kind of university graduates who are presenting themselves for training do not have academic depth in a specific subject field that high schools require. Professor Wisenthal feels that it is unlikely that this condition will change for the better unless active steps are taken to bring about the desired change.

The Association of Protestant Teachers' in Quebec states that the supply of teachers for vocational and technical training courses in composite high schools, as opposed to college preparatory courses, is virtually non-existent. There is at present only one technical and vocational normal school for French-speaking candidates. The Association feels that teachers will have to be acquired from industry to fill the gap until the teacher-training organization can be set up, staffed, and operated long enough to begin turning out technical and vocational teachers in significant numbers. The demand for teachers with technical skills is already high and will rapidly reach a peak that should be sustained for many years.

The Canadian Education Association is particularly concerned with the shortage of secondary school teachers with specialist qualifications. If one third of the university graduates in arts and science become secondary school teachers, their supply would approximately equal the demand but this would not mean that there would be a sufficient supply of teachers of special subjects. The Association reports that throughout Canada increased attention is being given to the upgrading of teachers. In-service programs and courses are being organized by departments of education, teachers' organizations, universities, and school boards. Summer school programs for teachers are being increased in number, and in some provinces departments of education are giving credit to teachers who complete approved courses organized by school boards and teachers.

The Ontario Secondary School Teachers' Federation reports that the greatest shortages of specialists appear to be in the fields

of mathematics, science, home economics, and commercial work. The great shortages in the fields of mathematics and science have been helped to some extent by the increasing numbers of graduates of faculties of applied science who are entering the teaching profession. The Minister of Education of the province of Ontario has also encouraged engineers to consider teaching in the secondary schools as a career. Secondary school vocational education is now available in almost all areas of Ontario, and a great many additional teachers are needed with industrial and technological training and experience.

The second Ontario College of Education opened at the University of Western Ontario in 1965 and a third College of Education will open at Queen's in 1966. The College of Education in Toronto and the two new colleges will have places for 2,200 students in regular sessions.

The Canadian Teachers' Federation reports that the trend toward graduate studies in education continues throughout Canada and that a particular expansion in this area is planned by the University of British Columbia, and in the establishment of a centre of graduate studies for the Atlantic provinces. The Canadian Education Association reports that most theses at the Master's level are concerned with secondary education and that the number of those in the general area of psychology is increasing.

The trend toward secondary school teachers possessing university graduation is particularly emphasized by the Alberta Teachers' Association and the British Columbia Teachers' Federation. In Alberta 37 per cent of all teachers had one or more degrees, while in British Columbia approximately 75 per cent of the secondary school teaching positions were filled by persons with at least one university degree. The British Columbia Teachers' Federation reports, however, that many of these are well-qualified, competent elementary school teachers who have been pressed temporarily into service at the secondary level. A number of these would be transferred to elementary positions if fully qualified secondary school teachers were available since their real interest and training are in terms of the elementary situation.

Higher Education

The rapid expansion of Canadian universities is producing a large demand for additional faculty. Students obtaining higher degrees, particularly the doctorate, make up the entire source of such new faculty personnel. The Canadian Universities Foundation reports that only about half of the new faculty being recruited by Canadian universities comes from Canada. During the three years from 1956 to 1958, 48 per cent of new faculty were recruited from outside of Canada. This percentage rose to 50 per cent in 1962. However, in using these figures it should be remembered that some of these persons were Canadians who were studying outside of Canada and others were non-Canadians who were studying in Canada on student visas and who later transferred to landed immigrant status.

Salary rates have continued to increase at universities. The Dominion Bureau of Statistics reported the University of Toronto and York University as having the highest salary floor for full professors during 1963-64 at \$13,000. One year later, in 1964-65, these floors were matched or exceeded by at least nine other institutions.

The increased emphasis during the past year which has been given to the development of junior colleges, technological institutes, and similar bodies in many different provinces is adding substantially to the demand for university faculty. These new types of institutions are growing much more rapidly than the universities themselves, and there is an increased tendency for such institutions to recruit faculty with higher degrees. Thus they are becoming competitive with the universities for faculty with these qualifications.

It has been suggested that perhaps we should use the term "higher education" to describe all fields of education beyond the secondary school level. This is the definition which is used by the United Kingdom Committee on Higher Education under the chairmanship of Lord Robbins. On this basis the United Kingdom had a total higher education enrolment of 216,000 during 1962-63 as contrasted with 130,000 in the universities. The committee anticipates an expansion of university enrolment to 219,000 during the 1973-74 academic year and to a total of 392,000 for higher education as a whole.

In Canada we have a similar set of circumstances. The Parent Commission anticipates that there will be a total of 68,500 students in Quebec universities in 1976-77. However, if we use the definition of higher education set forth by the Robbins Committee, the Parent Commission anticipates a total of 214,000 students in higher education during 1976-77. This compares with a prediction by Dr. E. F. Sheffield of the Canadian Universities Foundation that total enrolment at Canadian universities and colleges will reach 479,700 students by 1976-77.

The Parent Commission envisages three major university centres in Quebec (Montreal, Laval, and McGill) with graduate studies beyond the first degree being restricted to these three universities. Other university students would be at limited charter universities, awarding only the first degree. The Parent Commission advocates that a limited charter university must have one third of its faculty qualified to the doctorate level. At the institutes, for the balance of the students between high school and university, the Parent Commission recommends that the basic faculty qualification be that of the Master's degree and that a certain proportion of the faculty should hold a Doctor's degree.

Ontario and British Columbia have also announced elaborate plans to develop systems of junior colleges or their equivalent throughout the province, and it can be anticipated that they will have requirements for faculty comparable to those as set forth by the Parent Commission. On this basis we can anticipate that faculty qualified with higher degrees will have to be provided for a total student enrolment in higher education of approximately 700,000 in 1976-77, rather than the 479,700 figure predicted for universities alone. The 1965-66 full-time enrolment in higher education, (including universities, colleges, and technological institutes) was about 200,000.

To these totals must be added the faculty requirement needed to service the rapidly expanding total of part-time students in higher education. These enrolment figures are increasing even more rapidly than are the figures for full-time students. In addition, if the trend toward year-round operation continues in Canada, a greater

requirement for faculty will be produced than if the present system of two semesters a year is followed. The Parent Commission recommended in its report that the year-round system of operation for universities be taken under study.

On the basis of many developments taking place in higher education the estimate of additional faculty requirements made by the Economic Council of Canada in its first annual report of December, 1964, would appear to be conservative. The Council estimated that 2,800 more university teachers would be needed annually from 1964 to 1970.

Universities across Canada have announced elaborate plans to expand rapidly their faculties of graduate study. Should these plans materialize as anticipated then the additional facilities will produce the required faculty. However, these plans do require a very rapid expansion in the faculties of graduate studies. Illustrative of this is the annual report of the Nova Scotia University Grants Committee for 1964. In this report it is assumed that Dalhousie University will triple its full-time enrolment from 1963-64 to 1980-81, to a total of 8,160 students. During the same period of time, however, the faculty of graduate studies is expected to increase by nine times to a total of 2,000 students from the 1963-64 enrolment of 221.



ENGINEERING and APPLIED SCIENCES

THE Engineering Institute of Canada states that Canada is not producing enough engineers and that the demand continues to far exceed the supply. It would appear that

this situation of demand exceeding supply is becoming more accentuated. The major national employers of engineering graduates were able to fill approximately 80 per cent of their requirements for 1962 graduates. Two years later less than 70 per cent of the required 1964 graduates were recruited.

It must be pointed out, however, that some concern exists within the engineering profession that graduating engineers are not being used to full advantage in business and industry, and that they are filling jobs that should be held by technicians. An official of the Canadian Council of Professional Engineers recently said that with the proper utilization of our existing engineering manpower there would not be a shortage of engineers in Canada at the present time, except in some specialized areas such as mining. He expressed the opinion that many students are entering engineering when they in fact should be entering engineering technology, a field in which graduates are altogether too scarce.

The professional qualification in the engineering field is the Bachelor's degree. There is, however, an increasing demand for engineers with a Master's degree in view of the growing amount of research and development work being carried out in Canada.

The trend toward graduate study in engineering is evident in the number of Canadian universities which are adding graduate courses to their curricula. The University of Alberta in Calgary, which up to this year offered only the first two years of engineering training, will this fall offer the final two years with specialization in chemical, civil, electrical, and mechanical engineering. Additional courses leading to the Master's degree will also be offered and in some areas these courses will be available at the Ph.D. level.

Sir George Williams University will graduate its first engineers in 1967, with the first years of engineering being available to students enrolled in both day and evening divisions. Loyola College has also inaugurated a full degree program in engineering with specialized work in chemical, civil, electrical, and mechanical. Finally Lakehead University intends offering a degree in engineering.

The University of Waterloo offers a Master's degree on a co-operative program

basis. All engineering courses are of one semester's duration and only one semester need be taken at a time. *The Professional Engineer and Engineering Digest*, the journal of the Association of Professional Engineers of the Province of Ontario, describes the course as an opportunity for engineers now in professional employment to undertake formal study on an intermittent basis. It is not necessary to register as a Master's degree candidate in order to take any of the courses in the program.

During the 1965 annual conference of the Chemical Institute of Canada the obsolescence of engineers as a problem came under discussion. The ultra-rapid change that science and discovery are bringing about in the world require that an engineer keep up with these developments to remain competent. Along the same vein of thought is the report in the journal of the Professional Engineers of Ontario that it has been estimated that the "half life" of an engineer is only ten years. Ten years after graduation the engineer's knowledge is only 50 per cent as effective for dealing with his job as it was on graduation. This is reflected in the development of a series of engineering night courses in Canada.

The University of Waterloo has also established an institute of design. The purpose of the institute is to undertake fundamental research related to design and to carry out individual design projects. Membership in the institute will include professional designers from outside the university as well as faculty members from various departments.

McGill University has established a space research institute, the purpose of which will be to provide efficient administration and direction of the university's large scale programs in the aero space fields.

The trend to decreased numbers of graduates in mineral science disciplines seems to have reached an eight-year low in 1962-63. It is perhaps too soon to decide with certainty whether or not the small increase of 20 in the total number of graduates in 1964, and the even smaller increase of 10 in 1965, now indicates a move to increased enrolments. In any event, these increases thus far are confined entirely to the fields of metallurgical engineering and honours geology. All other disciplines in the mineral science field continue the downward trend in numbers of

graduates begun ten years ago. Fortunately, the trend to increasing numbers taking advanced degrees in mineral science disciplines continues.

A continuing excess of demand over supply of professional manpower for the immediate and foreseeable future is forecast for the mineral industry. The persistently decreasing enrolments in mineral science courses, the dramatic growth in the number of new mineral enterprises, increased exploration, and the continued interest in research, all contribute to the shortage now and in the future. A number of new research laboratories still require research staff.

The Canadian Institute of Mining and Metallurgy reports that the industry itself set a new record in value in 1964, with a growth rate of 12.7 per cent, and gives every promise of continued growth. The number of new mines under development or in the planning stage portends a period of intense competition in the recruitment of new graduates.

Although industry employs by far the largest number of mineral science personnel, various governmental agencies and the colleges and universities are employers of substantial numbers. Recent expansion of governmental programs and an increase in the number of colleges have increased requirements in these fields.

The Canadian Institute of Mining and Metallurgy stresses the fact that the mineral industry provides a number of good opportunities for chemical, civil, mechanical, and electrical engineers.

Two thirds of all engineering graduates are employed in industry while most of the remainder are absorbed into government service. A few who obtain graduate training teach in the universities.

The Canadian Council of Professional Engineers reports that salaries for engineers graduating in 1965 were up about four per cent over those of 1964 for most engineering disciplines.

Chemical Engineering

The Chemical Institute of Canada predicts a 20 per cent increase in the number of chemical engineering graduates in 1965, and a further increase of just under nine per cent is forecast for 1966. The number

of students, a total of 99, registered for Ph.D. studies in 1964-65 was twice the number registered four years earlier in 1961-62, while the 137 registered for the Master's degree was up 120 per cent during the same four-year period.

Although the majority of chemical engineers are employed in the provinces of Ontario and Quebec, the rapid development of industries in other parts of Canada has resulted in opportunities for chemical engineers in every province.

The number of industries that employ men with chemical engineering training is growing constantly, and prospects for graduates are good. Most graduates find employment in the chemical process industries or the resource extractive industries. Graduate work is necessary for most research positions and is also a prerequisite for those wishing to teach at the university level.

Starting salaries for chemical engineers are among the highest in the engineering fields. It is interesting to note that the larger national employers recruiting graduating chemical engineers were able to recruit about 90 per cent of their required 1961 graduates. Only 60 per cent of the required 1963 graduates were obtained and less than 70 per cent of the 1964 graduate requirement was filled. This excess of demand over supply is even more pronounced in recruiting at the Master's and Doctor's levels.

Only a few doctorates in chemical engineering are awarded each year in relationship to the Master's degrees awarded during preceding years. However, it is felt that these statistics are misleading since a number of chemical engineers with Master's degrees are awarded a doctorate in chemistry rather than chemical engineering. If one looks at the graduations in chemistry at the Ph.D. level, it will be found that substantially more graduate each year than are awarded Master's degrees during preceding years. Graduation statistics relating to higher degrees are contained in tables three and four of the appendix.

Civil Engineering

Just over 500 civil engineering graduates entered the employment market in 1965, marking a slight increase over the figures for 1964. This increase is now expected

to continue for some time, and the 1966 graduating class will probably be about nine per cent larger than that of 1965.

A substantial number of civil engineers enter construction and consulting firms and various government agencies. Civil engineers may also find employment in such diverse fields as the pulp and paper industry, petroleum industry, and the utilities field.

As in the other engineering fields, more emphasis is being placed on graduate work in civil engineering with the Ph.D. being the requirement for university teaching. The Faculty of Graduate Studies and Research at the University of Manitoba has announced two new graduate courses in city planning, one a diploma course and the other a Master's course.

The University of Alberta in 1965 opened a structural engineering research laboratory to provide much needed facilities for research in the field of structures by its staff and graduate students. This new lab has made possible a program of study in structures leading to the degree of Doctor of Philosophy in Civil Engineering. In revamping its engineering curriculum, the University of Alberta also eliminated surveying from all engineering courses except that of civil engineering.

Looking to the future, the chairman of the UCLA engineering department sees civil engineering as being heavily influenced by the "population explosion" and by the drive of those in the underdeveloped countries to catch up to the living standards of other countries. He sees the problems of the civil engineer in the next fifty years as being those of urban development, transportation, water supply, energy, waste reclamation, and recreational facilities.

Electrical Engineering

There is expected to be a six per cent increase in the number of electrical engineering graduates in 1966, compared to a ten per cent increase experienced the previous year. This continues the trend to increased graduations prevailing since 1964.

The Canadian Council of Professional Engineers reports that electrical engineers are still very much in demand, and graduates should have no difficulty in finding suitable employment.

A variety of employment is open to electrical engineering graduates, including work in the electrical design and manufacturing fields, and in the various areas of transportation, communication, and public utilities. There is now a constant demand for electrical engineers in the electronic computing devices field. While a number of graduates enter the federal government service or government agencies, the majority find employment within industry.

The University of Toronto started a series of graduate courses in electrical engineering during the summer of 1965. The timing of these courses is so arranged that employed engineers may attend lectures.

Starting salaries for graduates in electrical engineering are comparable to those in the other engineering fields and have shown a small increase over the 1964 figures.

Engineering Physics

The 1966 graduating class in engineering physics is expected to be approximately 15 per cent smaller than that of 1965.

Engineering physicists are generally employed to do fundamental research or development work toward the solution of a specific problem. In industry graduates are needed for development and production line work by manufacturers who produce highly technical products, while various governmental and industrial laboratories hire engineering physicists for pure and applied engineering research.

The solid background obtained in physics makes graduates from the engineering physics courses ideally suited to careers as geophysicists and meteorologists or meteorological officers. Various governmental agencies are the major employers of graduates looking to meteorology as a career, with the Meteorological Service of Canada employing the greatest number.

Starting salaries for the new graduate have shown one of the highest increases in the engineering field, being exceeded only by those for mechanical engineering graduates.

Geology and Geological Engineering

Graduates in both honours geology and engineering geology, in 1966, are expected to equal the number graduated in 1965. An



increase, however, is expected in the number of students taking graduate work. This is in accord with the trend of recent years as recorded in table seven of the appendix.

Employment prospects for qualified geologists remain excellent as the shortage in supply continues. The Geological Survey of Canada is unable to obtain sufficient Canadian geologists and summer assistants to staff its regular summer programs and must recruit non-Canadian college students for this purpose. Similarly, private companies are having increasing difficulty finding qualified geologists for their exploration programs.

Geologists with graduate training and summer experience are in most demand, as recruiting emphasis is increasingly directed to those who possess advanced degrees. Approximately one half of geologists in Canada now possess higher degrees. One field of specialization in which shortages are particularly acute is that of ground-water geology. Not only is Canada entering the International Hydrologic Decade with a great shortage of qualified specialists, but throughout the country increased attention is being given to water as a major natural resource.

Geophysics and Geophysical Engineering

An increase in the number of honours geophysics graduates is anticipated in 1966, but the Canadian Institute of Mining and Metallurgy does not expect that this increased graduation will even begin to meet the demand for such graduates.

Geophysical methods of exploration are being increasingly employed by exploration companies as an aid to mapping and in an attempt to locate buried and drift-covered deposits. There also seems to be a continuing demand for geophysicists to undertake foreign assignments under the various Canadian and United Nations foreign aid programs.

The majority of graduates in honours geophysics or geophysical engineering proceed to graduate work, thereby enhancing their opportunities for highly remunerative employment.

The tendency of many geophysicists to remain on at university, to continue re-

search in areas not applicable to mineral explorations work, or to prepare themselves for teaching responsibilities, may have long-term benefits. However, in the short term, it intensifies the shortage of geophysicists available for employment in mineral exploration.

Industrial Engineering

Industrial engineering is one of Canada's fastest growing occupations, and the employment outlook in this field is more than bright. In the opinion of the Guidance Centre of the Ontario College of Education, the increasing complexity of industrial operations and the expansion of automated processes, along with the tremendous growth of Canada's industries, is expected to further increase the demand for industrial engineers in the future.

The University of Toronto graduated close to 30 industrial engineers in 1965 and is expected to graduate 34 in 1966. The Nova Scotia Technical College became the second university in Canada offering a degree in industrial engineering in 1965, while the University of Windsor will offer industrial engineering in 1966. It is anticipated that the University of Saskatchewan in Regina will become the fourth university in Canada awarding degrees in industrial engineering.

Many industrial engineers gain their training through graduate studies following undergraduate work in engineering, science, or mathematics. There are a fairly large number of universities both in Canada and in the United States that offer graduate courses which prepare the student for work in industrial engineering or operations research. Those in Canada include McGill, Queen's, Toronto, Western Ontario, and British Columbia.

There is no doubt that the number of industrial engineers will increase vastly in the next decade, both by the output of the universities, and through graduate study.

At present, the skills of the industrial engineer are used by large corporations through the permanent hiring of staff specialists, and by smaller companies through the engagement of consultants on the staff of data processing, accounting, and consulting firms.

Mechanical Engineering

The 1966 graduating class is expected to be as much as 25 per cent higher than that of 1964, a considerable jump over the three per cent increase observed in 1965.

Graduates in the mechanical engineering field should have little difficulty in finding employment in this field with its wide scope of opportunities. Manufacturing industries as well as power plants are among the wide variety of industries which require mechanical engineers.

The scope of mechanical engineering is so wide and its services so basic that graduates in this field of engineering are in demand in a large number and variety of Canadian industries.

Starting salaries for the new graduate are among the highest of all disciplines of study and are exceeded by none of the other engineering fields where there are a significant number of graduates.

Metallurgy and Metallurgical Engineering

The demand for metallurgical engineers and metallurgical scientists continues to exceed the supply in this country.

The Canadian Institute of Mining and Metallurgy reports a particular shortage of those specializing in extractive metallurgy where the situation is somewhat similar to that in mining engineering.

Although the number of graduates specializing in physical metallurgy shows a continuing encouraging increase, particularly in the numbers with graduate degrees, the demand is expected to exceed the supply for some time. The increased number of firms constructing or expanding research facilities across Canada has created a markedly growing demand for research metallurgists, both physical and extractive, of demonstrated intelligence and ability.

Salaries in metallurgy remain among the highest offered to graduates. Details relating to graduations with higher degrees are contained in table five of the appendix.

Mining Engineering

It is in mining engineering that the greatest shortage of graduates exists. The successively smaller graduating classes are a matter of great concern to the Canadian Institute of Mining and Metallurgy. Classes

at some universities have been so persistently small that the departments of mining engineering at these universities are undergoing a period of great change.

Indicative of this change is the expansion in the mining engineering course at the University of Saskatchewan and the planned commencement of graduate study during the 1966-67 session. Research in mining engineering has also been initiated and is being developed during the 1965-66 session. It is suggested by those at the University of Saskatchewan that the mining industry requires ten graduates with a Bachelor's degree for each one with an advanced degree.

In an attempt to avert the industry crisis many believe is impending due to the lack of mining engineers and the lack of advanced mineral research, the University of British Columbia, Laval University, and Queen's University are co-operating closely in the design of their courses of study in order that there might be a free exchange of staff and pupils in mining engineering. Starting in September, 1965, each university will concentrate on graduate training for mineral engineers as well as research in about six special mining fields. Students and faculty will move freely among the three schools, but each student will graduate from the university where he entered the program. The new head of the mineral engineering department at British Columbia suggests that the new project will considerably raise the number of students in graduate programs.

Current graduates in mining engineering can look to a large number of job opportunities with few candidates to fill the available positions. The shortage of such graduates has persisted for so long that chances for rapid advancement for those of above average ability are excellent. Table six of the appendix contains statistics relating to the number of higher degrees awarded each year.

The average earnings of mining engineers are the highest of all professional engineering categories.

Survey Engineering

The position of the university graduate wishing to qualify as a surveyor varies greatly from province to province. The Canadian Institute of Surveying states that

depending on his degree, he will usually be exempted from most of the examinations in elementary mathematics and physics and also part of the period of articles. In the post-war years the reluctance of the professional associations to accord a greater measure of recognition of university qualifications has acted as a serious deterrent to university graduates entering the profession. As a result, apart from Quebec land surveyors, a relatively small proportion of Canadian surveyors are university graduates.

In recent years, however, the professional associations have become concerned at the declining number of university graduates entering the profession. The sharp increase in university enrolment has correspondingly reduced the numbers of suitable non-university people available to enter the profession. This has occurred at a time when the technical skills required of a surveyor appear to be growing ever more demanding under the pressure of new techniques, equipment, and methods.

In 1959 the Canadian Institute of Surveying sponsored a Colloquium on Survey Education to examine the national need for surveyors, to appraise the training then being given to surveyors, and to suggest ways of improving survey training available at Canadian universities. In 1960, as a direct result of this colloquium, the University of New Brunswick started a five-year degree course in survey engineering. The number of graduations across Canada has sharply increased from a total of 28 during the 1959-61 three-year period to 71 during the 1962-64 three-year period.

A Ph.D. degree in survey engineering is offered by the University of New Brunswick, while doctorates are offered in geodesy and surveying at Laval University.



Graduates in surveying will find specialized employment in federal government survey agencies, and are in demand to meet the need for property surveyors, and for men to introduce advanced survey methods into the fields of highways, power development, and the mapping of natural resources.

FORESTRY and FORESTRY ENGINEERING

THE shortage of professional foresters in relation to the demand is more pronounced at this time than for some time past. The Dean of the Faculty of Forestry at the University of Toronto reports that there are about twice as many jobs as there are graduates and about three times the number of suitable summer jobs as there are undergraduate forestry students.

According to the University of British Columbia, the demand fluctuates considerably, but the university reports no difficulty in placing its forestry graduates. Expansion of the pulp and paper industry has led to a very great demand for graduates and about 60 per cent of their forestry graduates work for the forest industry in British Columbia.

Foresters employed by industry are generally engaged in the planning and carrying out of all types of forest operations in addition to forest protection duties. Employment with provincial governments is primarily in management, inventory, protection, and administration of forest lands. The federal government expects to double its professional staff in forest research over the next six years.

Individuals expecting to work as foresters or forest scientists should prepare themselves by study toward the Master's or Doctor's degree in their field of interest. A very slight increase is shown in the number of students receiving graduate degrees in forestry in 1965, but this number is expected to grow since universities now offering graduate study in forestry intend major expansions in their programs during the next ten years.

The University of British Columbia has announced intentions of increasing the number of its forestry graduates to 70 a year from 41 in 1964, while the University of Toronto plans to increase its graduates from 24 a year to 40 in the near future.

Laval University is presently engaged in an expansion of its faculties and courses, particularly at the graduate level. This includes the inauguration of courses of study leading to graduate degrees in forest soils, forest pathology, resources management, and other fields. At the undergraduate level considerable work is being done in developing programs of study relating to the hydraulics of forest operations.

Students enrolled each year in forestry at the University of New Brunswick should increase to about 50 by 1975 from the present total of just over 30, with courses being added in forest soils, forest pathology, land use, and resources management.

Quebec's Deputy Minister of Lands and Forests reports that two complete degree courses in surveying are offered in Canada, one in the Faculty of Engineering at the University of New Brunswick and the other in the Faculty of Forestry and Geodesy at Laval. At the University of New Brunswick, the course is two years in length following the first three years in either civil engineering or forestry.

Starting salaries for the new graduate are good and have been increasing more rapidly than salaries in many other disciplines of study.



HEALTH PROFESSIONS

CANADA'S increasing population, the growing awareness of the need for proper health care and higher health standards, coupled with the expansion of our health services, continue to swell the demand for graduates from the various health professions.

In all areas of health care, graduates are not being produced fast enough to meet the demand, and both the training of these graduates and the facilities for this train-

ing are being expanded in an effort to meet this ever-growing need.

To help promote the growth of training and facilities in the health professions, the University of British Columbia has announced the construction of a health sciences centre on its campus. This centre, planned as a complex in which doctors, dentists, pharmacists, psychiatrists, nurses, physiotherapists, and other medical personnel will train and work together, will be the first of its kind in Canada. Included in the planning is a teaching and research hospital, with extensive research facilities, to which patients from all over Canada needing the special services of the unit can be referred.

The University of Ottawa has announced the establishment of a professional School of Hospital Administration which will have equal status with that university's schools of nursing, psychology and education, physical education and recreation, and social welfare.

Salaries in the health professions are rising steadily, with those offered in medicine being perhaps the highest offered to 1965 graduates.

Audiology and Speech Therapy

The demand for speech therapists is particularly high, and courses of study are provided by the universities of Montreal, Toronto, and McGill. The Royal Commission on Health Services reports that speech therapists and audiologists in Canada number only one to every 280,000 of population, whereas the desirable proportion would be one to 25,000 population. Training consists of two academic years at the universities of Toronto or Montreal, plus prescribed clinical experience in hospitals, rehabilitation centres, or schools. Applicants must possess a B.A. degree or the equivalent before commencing training.

A School of Human Communication Disorders has been opened recently at McGill in the Faculty of Graduate Studies and Research, with the course leading to an M.Sc. degree. Speech therapy and audiology are two complementary sciences and, in Canada, are taught together so that the graduate may elect to practise in either field and will understand the duties and problems of both. Opportunities for advanced training are available at institutions in the United States and England.



Speech therapists and audiologists are employed in hospitals, rehabilitation centres, clinics, and in special schools for the handicapped or deaf, as well as in the regular school system. Many enter private practice and some lecture at schools of speech and audiology. Employment is also available in local and provincial governments, as members of teams conducting mobile diagnostic and treatment clinics, or as part of organized home care programs.

Salaries range upwards from \$4,500 and are expected to increase rapidly.

Dentistry

Canada now possesses seven schools of dentistry located at the University of Alberta, McGill University, the University of Toronto, the University of Montreal, Dalhousie University, the University of British Columbia, and the University of Manitoba. These schools graduated about 240 dentists in 1965 and expect to produce another 244 in 1966, a small increase of just under one per cent. Approximately half of Canada's dentists graduate from the University of Toronto.

Canada now has more than 6,200 dentists of whom about 140 are women. More than 40 per cent of these practice in Ontario. The demand for dentists is high, and Canada's growing population will increase the demand for additional dentists in years to come. The Canadian Dental Association reports that in the past ten years, the number of dentists in Canada has increased 16 per cent while the total population has grown 26 per cent. In 1961, Canada had only one dentist to every 3,037, and this ratio became even more unbalanced in 1965 when it rose to one dentist for every 3,095 people.

The Royal Commission on Health Services recommended in its report that there should be 14,420 dentists by 1991 if we are even to keep up with present requirements, and also suggested expansion of present schools and the establishment of four new ones. One new school, at the University of Western Ontario, is expected to become operative in the fall of 1965.

The Canada Dental Association reports that the number of dentistry students engaged in Master's work in Canadian universities jumped from five in 1960 to 34 in 1965. However, the number undertaking doctorate studies during 1965 fell by eight

from a total of 40 in 1960.

Most dentists are self-employed, but some graduates do find employment in federal, provincial, and municipal governments. The federal government now employs 231 dentists on a full-time basis. A small number of dentistry graduates each year find positions with hospitals, industry, and school boards. Starting salaries for dentists are quite high and compare well with those for medicine.

Medicine

Opportunities for a career in medicine were never more attractive in Canada's history. The Canadian Medical Association states that the supply of physicians must increase at a rapid rate if Canada is to meet the health needs of its population in the coming years.

The Association reports that by 1975, just ten years away, 1,500 new doctors per year will be required to maintain the current physician-population ratio which is approximately one doctor for every 900 persons. This represents a very large increase in output from the existing rate of 850 per year from all Canadian schools.

The Association feels that Canada's need for doctors is portrayed by the recommendation of the Royal Commission on Health Services that seven new medical schools should be established within approximately an eight-year period. A number of these schools are now being planned by the universities concerned. In addition the 12 existing schools are expanding their capacity to the maximum. McMaster University has announced that construction on its new medical school will begin in the fall of 1965.

The upward trend in enrolment which began in 1960 continues. The report, *Medical Students in Canadian Universities*, reveals that 1,133 students began medical studies in 1964 compared with 1,086 the previous year. An overall increase of 10 per cent is expected in the 1965 graduating class.

Twelve Canadian universities offer complete courses leading to the Doctor of Medicine degree, and admission standards to the faculties of medicine remain high. Specialization in medicine requires from three to five years following graduation before the qualifying examinations of the Royal College of Physicians and Surgeons of Canada can be taken.

The physician now has a vast number of vocations open to him. He can enter general practice, carry out research or laboratory work, teach at the university level, or he can enter the medical services of the armed forces or the expanding field of medical administration. The federal government as well offers a variety of opportunities requiring almost every type of medical specialty.

Salaries for physicians are considerably higher than those of the other professions and generally start at the \$8,000 range.

Nursing

The number of nurses registered in Canada increased by 50,000 over the 1941 figure to a total in 1961 of 78,340. However, there is still a very serious shortage of qualified nurses, and the ratio of registered nurses to population is still below the ratio of one nurse per 200 population considered desirable by the International Labour Office. It has been stated by hospital officials and organizations concerned that the supply of nurses must increase by more than 20,000 if present standards are to be maintained, and an increase of nearly 42,000 would be desirable if improved standards of patient care are to be provided.

During the summer of 1965 plans were outlined by the government of Ontario to alleviate the nursing shortage in that province. The objective of Ontario is to graduate 5,000 nurses per year by 1971, about double the 1966 provincial graduating class.

The shortage extends particularly to personnel in rural areas and in mental hospitals, and there is also a lack of nurses with advanced education for senior positions in nursing education, practice, and research. The Master's degree in nursing is offered at three universities. These are the two older courses at Western Ontario and McGill and the recently established course at the University of Montreal. The University of New Brunswick is also planning to introduce the Master's degree in nursing, while the University of Ottawa has had the matter under consideration.

The Canadian Nurses' Association in its tabulation of nurse training reports 185 schools of nursing in Canada. Five universities have established schools of nursing since the 1961-62 academic year and there are now 22 universities with schools, 19 of

which offer a Bachelor's degree in nursing. The Director of the School of Nursing at the University of Manitoba feels that one third of Canadian nurses should have Bachelor's degrees and 13 per cent should have graduate degrees. Currently five per cent have Bachelor's degrees and less than one per cent have a graduate degree. It is estimated that the number of Bachelor degree graduates will be about 16 per cent higher in 1966 than it was in 1965.

Hospitals and institutions employ the majority of nursing graduates, but may also find suitable employment in doctors' offices, in private practice, with government health agencies, in the armed forces, and with home-visiting organizations such as the Victorian Order of Nurses.

Nurses are also employed by international agencies to assist in the organization and development of health services in foreign countries. Rewarding work is offered to nurses as well in outposts maintained by the Canadian Red Cross.

Salaries for nurses vary with training, experience, and responsibilities, but they are steadily improving.

Occupational and Physiotherapy

The important role of physiotherapists in the rehabilitation of the physically handicapped disabled by polio, muscular dystrophy, arthritic and rheumatic conditions, birth deformity, accident, or war, has brought about a very great demand for their services.

The Canadian Physiotherapy Association reports that despite a rise of 200 since 1964 in the number of physiotherapists practising in Canada, there are still more positions than this increased number can possibly fill. To help meet the demand, two new courses will be opened in 1965, at the University of Saskatchewan and at Laval University. This brings the total number of universities offering courses in physiotherapy to nine. Both courses will offer two-year training in physiotherapy leading to a diploma, and students will be required to spend approximately six months in physiotherapy graduate internship to qualify for registration.

McGill University is at present the only Canadian school offering a B.Sc. degree in physical and occupational therapy and reports twelve graduating with the B.Sc.

degree in 1965, as well as 60 who will be completing the three-year diploma course. At the University of Manitoba, the School of Physiotherapy and Occupational Therapy has been renamed the School of Medical Rehabilitation and located in the Manitoba Rehabilitation Hospital.

Physical and occupational therapy is available to the physically handicapped in every hospital and medical centre in Canada, and most therapists are employed by these institutions. A number of therapists find employment in the special schools and summer camps operated for the benefit of crippled children.

The demand for occupational therapists is similar to that for physiotherapists and graduates in that field should have no difficulty in finding gainful employment. Rehabilitation centres, tuberculosis sanatoria, schools for the handicapped, homes for the aged, convalescent and children's hospitals, cerebral palsy clinics, and general psychiatric clinics all employ occupational therapists. Five universities offer qualifications in occupational therapy (Toronto, McGill, Alberta, Manitoba, and Montreal). A special 18-month course is given by the Canadian Association of Occupational Therapy in Kingston, Ontario.

Pharmacy

Growth in all phases of pharmacy, plus the fairly stabilized production of pharmacy graduates, is expected to produce a shortage of the order of 500 pharmacists by 1966 across Canada. This is projected further to a shortage of 630 by 1971, according to a study carried out for the Royal Commission on Health Services.

Eight Canadian universities maintain colleges offering degree courses in pharmacy (Alberta, British Columbia, Dalhousie, Laval, Manitoba, Montreal, Saskatchewan, and Toronto). Three universities (Alberta, Montreal, and Toronto) award Ph.D. degrees.

Enrolment in the Canadian colleges of pharmacy for the year 1964-65 totalled 1,153 men and 523 women in the undergraduate course, and 35 men and 11 women pursuing graduate studies. The Canadian Pharmaceutical Association marks as the most notable statistic the growing number of women, reaching upwards of 50 per cent

in some Canadian colleges, enrolling in the university course in pharmacy.

There has been no change in the educational facilities for pharmacy in the past year, but most schools are consistently improving their courses and, as a result, their students in both undergraduate and graduate departments.

The graduating class of 1965, totalling more than 300 students, represents an eight per cent increase over the previous year, but an increase of more than 20 per cent has been forecast for 1966. The Pharmaceutical Association reports that because of the increasing number of women currently registering in pharmacy colleges, and assuming a relatively short female working life, prospects for employment in pharmacy for the next several years look bright.

Almost 80 per cent of new graduates find employment in the retail field. However, a number of pharmacy graduates, particularly women, find positions in hospitals and medical services, as well as with pharmaceutical companies, the armed forces, and other federal agencies.

The increased role of federal and provincial governments in public health has created additional opportunities for pharmacists in analytical and toxicology laboratories, and in administrative positions as government inspectors and health supplies officers.

Starting salaries for new pharmacists continue to be among the highest offered to all Bachelor graduates.

HOME ECONOMICS

THE demand for graduates with Bachelors' degrees in home economics continues to exceed the supply, and the positions available to graduates are many. The Canadian Home Economics Association divides the field of work for home economics into six broad groupings. These are dietetics, education, governmental service, business, social and welfare agencies, and research.

The requirement for home economics teachers in the secondary schools continues to grow with the population expansion. Although sixteen universities and colleges offer a degree in home economics, there is a shortage of home economics graduates for teaching positions in nearly every province.

A Master's degree can be obtained at Alberta and Manitoba while Toronto offers a Master's degree in food science. Graduates are now being called upon to teach in technical and trade schools, particularly in training courses for the food service industry. A one-year course in education following the Bachelor of Home Economics degree is necessary in most provinces to qualify as a specialist.

Professional qualifications in dietetics include a degree in home economics or dietetics plus a one-year internship after graduation; the completion of an integrated internship in the summers between undergraduate years, plus a four-month final period following graduation. Membership in the Canadian Dietetic Association is based on completion of requirements as set down by the respective provincial associations. A few men graduate each year from the dietetic course at the University of Montreal. Provision is also made for men interested in dietetics to enrol at either McGill or Mount Allison universities.

The Director of the School of Household Science at Macdonald College predicts that the present demand for dietitians will continue in the foreseeable future. Careers in dietetics in hospitals include clinical and administrative work, teaching, and therapeutic dietetics. Dietitians are also employed in school feeding services in the larger cities. The food service industry offers management positions to graduates who have completed internship and have gained some related experience.

In public relations with companies processing food or manufacturing food products, home economists answer questions from consumers and assist with advertising programs. Limited opportunities exist, also, in the textiles and clothing industry for graduates who specialize in this area. Women's magazines frequently employ home economists on their editorial staffs.

The Director of the School of Home Economics at the University of Manitoba states that there is almost unlimited opportunity for home economists to develop ideas and explore new and interesting areas of work. Technological advances and changing family patterns make for variety in the profession, and a great deal of time must be spent keeping abreast of new developments.

A number of home economists proceed each year to graduate degrees in a number of specializations. Of these students, some continue in research while others teach at the university level where, Macdonald College reports, there is a shortage of qualified personnel with advanced degrees.



Graduations in home economics in 1966 are expected to show an increase of 22 per cent over 1964 figures. Salaries for starting dietitians and teachers are usually higher than those offered by industry; hence the majority of graduates enter these professional fields.

JOURNALISM

THE revolution in communication and transportation, the rise in world-wide literacy, and the increasing complexity of life has brought about an urgent need for journalists with a first-rate education coupled with sufficient training in the primary skills of journalism to enable them to move easily and effectively into the various regions of the field.

Courses leading to the Bachelor of Journalism degree are now offered at two Canadian universities — Carleton and Western Ontario — while diploma courses are offered at the University of King's College (affiliated with Dalhousie) and Mount Saint Vincent College, both at Halifax. As well, Carleton offers a one-year graduate course in journalism to holders of a Bachelor's degree in arts, science, or commerce. Eighteen journalism graduates emerged from Carleton University in 1965, three of them having prior degrees.

A great variety of opportunities are open to the journalism graduate with perhaps the

most popular being the field of newspaper writing, though the salaries offered here are generally slightly lower than in other areas of journalistic endeavour. Journalists may also find employment as reporters and news editors with radio and television, as information and public relations officers in business and industry, and as writers and editors with the various popular Canadian magazines and periodicals. The operation of information, editorial, and public relations divisions within each department of the federal government means a demand each year for a number of journalism graduates.

Salaries for journalism graduates are generally similar to those offered to pass arts graduates, but vary considerably with the numerous areas of journalism.

LAW

THE Canadian Bar Association reports a shortage of able, experienced counsel to meet the increased public demand for general practitioners and suggests that a wide variety of opportunities exist for anyone with an aptitude for law and the desire to devote the time and effort required to obtain the necessary training and experience.

The Association further observes that the number of lawyers being called to the Bar each year is continually increasing and that this trend is expected to last for a number of years to come. A 26 per cent increase in the number of law school graduates is predicted for 1966.

Some lawyers devote themselves exclusively to specialization in one aspect of the law such as corporation law, tax law, patent law, or labour law. This specialization, however, is more evident in the larger centres, for rural area lawyers must usually conduct a more general type of practice. The Law Society of British Columbia offers the opinion that those who may be said to specialize simply concentrate on a particular aspect of the law and thus become expert in one area without completely withdrawing from the other areas. Or, in simpler terms, that lawyers become specialists through the practice of law rather than by any course of study.

Lawyers may find employment in the law departments of the industrial and mercantile companies as well as with governmental agencies and departments where the com-

plexity of the problems facing government and industry make it particularly desirable that the legal implications of any particular corporate action be properly understood before such action is taken.

The Canadian Bar Association suggests that no increase is indicated in the number doing graduate work among those who intend to engage in private practice. However, the Association does point out that the growing number of law teachers now required in Canada is boosting the number of students engaging in graduate work. While an individual may obtain a position on a law faculty on the basis of his undergraduate standing, his potential is very much limited until he obtains a higher degree or degrees.

Qualification as a lawyer in one province in Canada does not qualify a student for practice in any other province, though the governing bodies of the profession in the common law provinces have adopted fairly uniform standards of admission from one province to another. Quebec, governed provincially under civil law, does not conform to these uniform standards. Admittance to the practice of law in Canada is usually granted following a two- or three-year university pre-legal education plus the Bachelor of Laws degree from a Canadian law faculty and a period under articles of clerkship with a practising member of the profession.

During 1965 it was reported that Osgoode Hall might join with York University as the University's law faculty, thus ending a long history of operating independently.



LIBRARY SCIENCE

THE number of library science graduates obtaining the B.L.S. degree increased from about 250 in 1964 to close to 350 in 1965.



However, even if this increase carries over to the 1966 graduating class, there is little possibility of meeting the figure of 2,600 professional librarians that the Canadian Library Association reports will be required by 1967. Graduates thus should find rewarding employment very easy to obtain.

The basic qualification for the professional librarian is a Bachelor's degree in arts or science plus one full year of library training leading to a B.L.S. at one of five Canadian universities (McGill, Ottawa, Montreal, British Columbia, and Toronto). Three of these schools (British Columbia, Toronto, and McGill) have been accredited by the American Library Association's Committee on Accreditation under its 1951 Standards, and are approved by the Canadian Library Association. In 1965 a brief was presented to the presidents of the prairie universities, by a committee of university librarians, which proposed the establishment of a library school at one of the prairie universities.

There are many areas of specialization within the profession itself. They include: reference librarians, who are experts in finding information and answering questions; cataloguers and classifiers, who are responsible for cataloguing and classifying books so that related information will be kept together on the shelves; circulation librarians; children's and young people's librarians; regional and county librarians; school and university librarians; and special librarians who serve the particular needs of one organization or group. The chief librarian is responsible for the administration of the library and must be a good business executive as well as a competent professional librarian.

The starting salary for 1965 library science graduates has taken a considerable jump over that of 1964, due in part to the high proportion of librarians hired by university libraries. The salary in medium-sized and large libraries now compares very favourably with other professions requiring an equivalent number of years of preparation. The Dominion Bureau of Statistics in a survey of median starting salaries for 1965 graduates found that the highest salaries were in Western Canada and the lowest in the Atlantic provinces. More than half of the 1965 graduates were employed by universities.

Indicative of the growing importance of university libraries is the recommendation for McGill University cited by the Parent Commission Report. This recommendation involves the expenditure by McGill of ten million dollars for books and periodicals over a ten-year period.

The growth of libraries in North America and the increasing demand for the services they offer is shown in the steps now being taken by three Eastern United States university libraries. The medical libraries of Harvard, Columbia, and Yale universities are in the primary stages of an electronic integration that will see a network of computers and telephone lines giving scholars virtually instant access to their pooled resources. Yale's medical librarian believes that this project will stand historically with the development of the card catalogue as an advance in library science.

OPTOMETRY

THERE are in Canada today 1,434 practising optometrists which, according to the Canadian Association of Optometrists, falls about 180 short of immediate requirements. The Association further states that another 280 will be required by 1980 to compensate for population increase and losses to the profession through death and retirement.

Enrolment in both Canadian optometry colleges is at an all-time high with some 76 students at the University of Montreal, and 97 at Toronto. The School of Optometry at Montreal requires a B.A. degree or equivalent for entrance and the College of Optometry in Toronto requires Ontario Grade XIII.

The work of the optometrist is to provide personal vision care without the use of drugs or surgery. While most optometrists maintain general practices, there are areas of specialization. Some concentrate on child-vision or school-vision problems while others prescribe and fit contact lenses, telescopic, and other low-vision aids for the nearly blind. Optometrists practising in an industrial area may advise on such matters as industrial safety, illumination, or industrial vision. Teaching, research, and highway safety are other areas of work.



PHYSICAL EDUCATION

THERE continues to be a serious lack of professional physical education graduates in school and agency positions normally requiring specialists with professional degrees. The Director of the School of Physical Education and Recreation at the University of British Columbia reports that female physical education teachers are particularly needed with little likelihood of the demand for them being met for years to come. The situation is, however, gradually improving with a steady increase in the enrolment of undergraduates.

Projections for 1966 indicate a 15 per cent increase in the number of physical education graduates. Four new undergraduate programs have been announced in the last two years, making a total of fourteen universities now offering undergraduate degrees in physical education. Some universities provide for a major which a student may take in the Bachelor of Education degree program.

The Director of Physical and Health Education at the University of Toronto observes that graduate work in physical and health education in the past has been largely carried out in the United States with a few going to Europe. With the establishment of graduate programs in several Canadian universities, an increasing number of graduates are going on to a second degree in Canada. Opportunities for such graduates are numerous and include advanced teaching, university teaching, recreation, and work in various government departments.

The expanding program of the Director-

ate of the National Advisory Council on Fitness and Amateur Sport of Canada has resulted in a number of opportunities for graduates as directors of programs in the different provinces as well as at the national level. A large part of the budget of the National Advisory Council has been apportioned to research in the field of physical education, recreation, and fitness.

Largely as a result of the assistance provided through the Fitness and Amateur Sports Act, the number of students engaged in graduate programs has increased to almost five times the number involved as recently as three years ago. In 1965-66 there will be approximately 140 students in Master's degree programs and 40 students working toward a Ph.D. degree.

The Dean of the Faculty of Physical Education at the University of Alberta suggests that the time is fast approaching when doctorate degrees will be required for university positions. Junior colleges, large high schools, and governments positions will require the Master's degree. The Canadian Association for Health, Physical Education, and Recreation reports that graduate work is now being offered at four Canadian universities (Alberta, British Columbia, Saskatchewan, and Western Ontario). A Master's degree is also in the planning stage at the University of New Brunswick. Areas of specialization include exercise physiology, psychological bases of motor performance, historical and comparative studies, and administration. It is possible for graduates to go on towards second degrees in research carried on in departments of universities other than physical education, such as faculties of medicine, as well as other related professions.

The Director of the School of Physical Education at the University of Saskatchewan states that there is an increasing awareness and interest in the health aspect of athletics and physical education and commonly referred to as physical fitness. As a result there is an increased demand for practitioners who are knowledgeable and are qualified to administer exercise programs for various age groups under different conditions.

There is a re-emphasis of physiology of exercise and training and more and more communities are seeking professionally trained personnel to serve as directors and

supervisors of recreation. The University of Ottawa intends offering a degree in recreation in the near future, while the University of Alberta and the University of British Columbia are presently providing studies leading to degrees with specialization in recreation.



SOCIAL WORK

THE Canadian Association of Social Workers reports that there are about 3,000 professionally qualified social workers in Canada, which would indicate a serious shortage of trained personnel in this field. The employment outlook is good, and opportunities for social workers are many and varied.

Social workers are employed in family and child welfare agencies, as well as in public welfare agencies. In the larger cities there is an increasing emphasis on neighbourhood services, and many graduates will find rewarding employment in neighbourhood centres where they help in the development of neighbourhood life. Many social workers find suitable employment in both general and mental hospitals and in child welfare clinics.

Employment in many departments of government, such as National Health and Welfare, Veterans Affairs, Northern Affairs, Citizenship and Immigration, and Indian Affairs, is offered to graduates in social work. Provincial departments of social welfare, child welfare, or rehabilitation services absorb a large number of graduates every year.

A large percentage of social workers are employed in public schools; in group work agencies such as YWCA, YMCA, settlements, community centres; in special serv-

ices to alcoholics, prisoners, and ex-prisoners, or as probation and parole officers. A number become research workers or direct community planning services.

The usual preparation for social work is a university degree in the liberal arts, followed by two years of graduate education leading to the Master of Social Work degree at one of Canada's eight schools of social work. Two new schools of social work are anticipated with the recent announcements by the University of Alberta and Waterloo Lutheran University of the establishment of social work studies in 1966.

Salaries for social workers are rising gradually and, as in other disciplines, depend on the academic qualifications of the graduate.

VETERINARY SCIENCE

THERE are at present three schools of veterinary medicine in Canada. These are the Ontario Veterinary College, Guelph, and L'Ecole de Medicine Veterinaire, St. Hyacinthe, P.Q., and the new school at the University of Saskatchewan, which admitted its first students in the fall of 1965. The Canadian Veterinary Medical Association expects that the new Saskatchewan school should considerably increase the number of graduates when the first ones complete their courses in a few years. The Ontario Veterinary College is changing its course format, effective September, 1965, to a two-year pre-veterinary course plus a four-year professional course. Saskatoon's new college has a similar format.

An increasing number of veterinarians are enrolled as graduate students in the various universities in Canada. There are now 24 enrolled as graduate students at the Ontario Veterinary College, and two at the Ontario Agricultural College. The growing emphasis on basic research will produce an increase in this sphere of activity in veterinary medicine as more funds become available.

The federal government is the largest single employer of veterinarians (about 27 per cent) and will continue to require new graduates and experienced veterinarians as the livestock industry continues to grow. Although the number of multiple member practices is continuing to increase, Dr. H. J. Neely, of the Ontario Veterinary Services

Branch at Ontario Veterinary College, expects that the overall number of veterinarians in general practice will probably decrease. This trend is likely the result of more efficient practice units, fewer farm units, and more emphasis on disease prevention. Veterinarians in increasing numbers will be required by provincial governments and other public agencies as new animal health programs and food protection legislation are inaugurated.



NES STUDENT PLACEMENT SERVICE

The public employment service has been active in the student placement field since 1927 when a student placement office was established at the University of Manitoba by the Manitoba Employment Service.

Today there are 40 full-time NES Student Placement Offices at universities, colleges, and technological institutes. A part-time service is also provided on campus at a number of other institutions where staff has not yet been allocated for the establishment of full-time offices. Twenty-nine of the offices are located at universities and colleges. These are listed, together with five additional institutions which are being provided with a part-time service on campus, and are accordingly marked with an asterisk.

NEWFOUNDLAND

Memorial University, St. John's

NOVA SCOTIA

Acadia University, Kentville

Dalhousie University, Halifax

*Mount St. Vincent College, Halifax

Saint Mary's University, Halifax

PRINCE EDWARD ISLAND

*Prince of Wales College, Charlottetown
St. Dunstan's University, Charlottetown

NEW BRUNSWICK

Mount Allison University, Sackville
Université de Moncton, Moncton

QUEBEC

*Ecole des Beaux-Arts, Montréal
Loyola College, Montreal
Macdonald College, Ste. Anne de
Bellevue

Sir George Williams University, Montreal
Université de Montréal, Montréal
Université Laval, Québec
Université de Sherbrooke, Sherbrooke

ONTARIO

Lakehead University, Port Arthur
Laurentian University, Sudbury
McMaster University, Hamilton
Saint Patrick's College, Ottawa
University of Ottawa, Ottawa
University of Windsor, Windsor
York University, Toronto

MANITOBA

*Brandon College, Brandon
United College, Winnipeg
University of Manitoba, Winnipeg

SASKATCHEWAN

University of Saskatchewan, Regina
University of Saskatchewan, Saskatoon

ALBERTA

*Mount Royal College
University of Alberta, Edmonton
University of Alberta, Calgary

BRITISH COLUMBIA

Notre Dame University, Nelson
Simon Fraser University, Burnaby
University of Victoria, Victoria

The basic terms of reference used in establishing an NES Student Placement Office on campus involve, first of all, an invitation from the university or college to the National Employment Service to open discussions. It is then necessary to determine whether or not the institution is large enough to produce the workload which would warrant the provision of the basic staff required on a full-time basis.

The NES requires that the university or college assign to it full operational responsibility in providing the placement service. The institution retains a primary respon-

sibility of insuring that an effective placement service is provided for its students. The university or college designates one of its faculty, or an administrative officer, to carry out this function and to act in a liaison capacity between it and the NES Student Placement Office.

The university or college provides premises and services such as light, heat, messenger and mail services, notice boards, duplicating facilities, telephones, and so forth. The NES provides staff, furniture and furnishings, office equipment, postage, stationery, long distance telephone, and telex facilities. Personnel in charge of full-time NES Student Placement Offices at universities and colleges play an active part in The University Career and Placement Association.

At NES Student Placement Offices students desiring assistance in finding suitable employment or who want information on careers are interviewed and given information concerning different occupational areas and the qualifications required to fill positions in these areas. Students may be referred to appropriate local employers directly, to those outside of the local area through NES referral facilities, or interviews may be arranged with recruiters visiting the university or college.

Most of the larger national employers send recruiting teams to universities, colleges, and technological institutes. The recruiting process is continuous throughout the entire year but visits by employers to institutions of higher education are heaviest during two periods. The first of these is November and the first half of December while the second covers the second half of January, February, and March.

The NES Student Placement Service is not only involved in the placement of graduating and graduate students in permanent employment and in advising on career opportunities. It also provides assistance in finding summer and part-time employment for all students wishing to obtain such work.

Students attending a university or college where there is no NES Student Placement Office may obtain assistance at local NES offices. Although the service is not as complete as that which would be provided on campus, arrangements are made to meet the special needs of students in finding suitable employment.

Technological Institutes

The NES Student Placement Service also operates full-time offices at 11 technological institutes and these are listed. A technological institute being provided with a part-time service on campus is marked with an asterisk.

NEWFOUNDLAND

Newfoundland College of Trades and Technology, St. John's

NEW BRUNSWICK

New Brunswick Institute of Technology, Moncton

*Saint John Institute of Technology, Saint John

QUEBEC

Quebec Institute of Technology, Quebec
Laval Institute of Technology, Montreal

*Montreal Institute of Technology, Montreal

ONTARIO

Eastern Ontario Institute of Technology, Ottawa

*Lakehead University Technology Division, Port Arthur

Western Ontario Institute of Technology, Windsor

MANITOBA

Manitoba Institute of Technology, Winnipeg

SASKATCHEWAN

Saskatchewan Technical Institute, Moose Jaw

ALBERTA

Northern Alberta Institute of Technology, Edmonton

Southern Alberta Institute of Technology, Calgary

BRITISH COLUMBIA

B.C. Institute of Technology, Burnaby

Technological institutes provide an alternative educational path beyond secondary school to that offered by universities and colleges. Accordingly the NES Student Placement Service is available on the same basis as it is at universities and colleges.

A separate supply and demand booklet relating to the graduates of technological institutes is published and is available on request.

APPENDIX

Starting Salaries

Starting salaries offered new 1965 graduates have once again shown an increase over those of the preceding year. The increases range from a high of approximately 10 per cent in chemistry and biochemistry, forestry, library science, and social work, to small increases in such areas as education, honours biological science, and mining engineering. This marks the second consecutive year that library science starting salaries have shown a substantial increase. At the Master's level, about one third of the disciplines show increases of approximately 10 per cent. Close to a 10 per cent increase is shown in the starting salary rate for Ph.D. chemical engineers.

The estimated monthly starting salaries were obtained from three sources. The library science information is partially based on a survey conducted by the Dominion Bureau of Statistics in 1965. The two other sources were a survey of national employers active in the recruitment of university graduates and a survey of personnel engaged in the placement of university students in employment. In instances where there was insufficient information or the sample was too small to provide a valid estimate, no figures are given.

Graduations

Table two estimates the number of students expected to graduate by discipline from each university. The bulk of these figures were taken from a survey conducted by the Higher Education Division of the Dominion Bureau of Statistics. However, the figures for Laval and the University of Montreal were compiled from the 1964-65 editions of their respective enrolment and graduation reports. In the engineering, mining, and metallurgical disciplines, the

statistics are based on the 1964-65 surveys conducted by the Engineering Institute of Canada, Canadian Institute of Mining and Metallurgy, and the Chemical Institute of Canada. In addition, statistics supplied by the Canadian Universities Foundation and by the Fédération des Collèges Classiques were used in the compilation of the graduation tables.

The smaller charts, tables three to seven, for graduate degrees were based on figures obtained from surveys conducted by the Chemical Institute of Canada, the Canadian Institute of Mining and Metallurgy, and the National Research Council. The disciplines covered by these tables account for about 60 per cent of graduations at the Ph.D. level. To all these institutions we wish to acknowledge our appreciation for the availability of their surveys.

The estimates include only the students studying at the main centre of the university, and do not include those students at affiliated institutions located elsewhere. However, those studying at École des Hautes Etudes Commerciales are included with the University of Montreal. Further, these estimates include part-time students graduating in 1965 and 1966 enrolled at institutions providing such facilities. Finally, attrition rates have been calculated over the period 1961-65 and have been applied to the various survey estimates.

Dashes (—) indicate either no graduating students or that insufficient information was available to warrant an estimate. The figures appearing as estimated totals are not necessarily columnar totals. Instead they represent the number of graduates from the tabulated universities and colleges expected in 1965 and 1966, as determined by the percentage increase or decrease of comparable figures between the two graduations of 1965 and 1966.

TABLE ONE—1965 UNIVERSITY GRADUATES

Estimated Monthly Starting Salaries

THE following salary table relates only to 1965 graduates and not to those of 1966. Furthermore the salary rates quoted are not derived from surveying 1965 graduates. Instead they are estimates of the salaries which were offered to 1965 graduates by the larger national employers before actual employment commenced. Starting salaries offered by local employers to 1965 graduates may either be above or below these figures depending upon local employment practices.

DISCIPLINE	BACHELORS \$ per month	MASTERS \$ per month	DOCTORS \$ per month
General Arts & Science (Pass Degree)	405	—	—
Honours Biological Sciences	427	—	—
Honours Chemistry & Biochemistry	469	539	747
Honours Economics & Political Science	435	497	—
Honours Geology	471	547	700
Honours Mathematics	466	528	—
Honours Mathematics and Physics	468	519	—
Honours Physics	467	513	—
Honours Psychology	421	478	—
Honours Sociology	427	483	—
Agricultural Engineering	480	—	—
Chemical Engineering	483	560	772
Civil Engineering	476	533	—
Electrical Engineering	478	534	690
Engineering Physics	481	543	700
Mechanical Engineering	483	522	—
Metallurgy & Metallurgical Engineering	478	537	—
Mining Engineering	487	—	—
Architecture	475	—	—
Agriculture	452	496	675
Forestry	480	—	—
Commerce and Business Administration	443	550	—
Commerce for CA Articles only	389	—	—
Education	431	514	—
Home Economics	387	—	—
Library Science	448	500	—
Nursing Degree (with R.N.)	408	—	—
Nursing Diploma (with R.N.)	314	—	—
Pharmacy	498	—	—
Physiotherapy	362	—	—
Social Work	419	473	—
Medicine (M.D.)	750	—	—
Dentistry (D.D.S.)	725	—	—

ESTIMATED GRADUATIONS BY DISCIPLINES (1965-66) — TABLE TWO

HONOURS ARTS AND SCIENCE																
	Arts and Science (Pass and General)		Econ. and Polit. Sci.		Psychology		Sociology		Biol. Sci.		Chemistry		Math.		Math. and Physics	
University	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66
Acadia (1)	158	190	1	—	1	—	—	—	3	2	5	—	3	1	1	—
Dalhousie (2)	198	397	1	1	2	3	—	—	6	5	3	3	6	5	5	9
Memorial (3)	103	133	3	4	—	—	3	1	3	8	3	1	3	3	4	7
Mount Allison (4)	154	155	1	1	—	—	—	—	1	3	3	5	4	6	1	3
Mt. St. Vincent (5)	58	114	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N.S. Tech. (6)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Dunstons . . (7)	70	77	—	—	—	—	—	—	—	—	—	—	—	—	—	—
St. F. Xavier . . . (8)	171	233	—	—	—	—	—	—	—	—	2	3	4	1	—	1
St. Mary's (9)	81	77	—	—	—	—	—	—	—	—	1	—	—	—	—	—
U. of Moncton (10)	100	162	—	—	—	—	—	—	—	—	—	—	—	—	—	—
U.N.B. (11)	237	311	—	4	4	3	3	2	2	2	2	—	1	1	—	2
Bishop's (12)	98	94	—	2	—	6	—	—	—	—	—	—	—	4	1	—
Coll. Ste. Marie (13)	206	240	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laval (14)	165	215	32	44	—	—	16	12	13	6	10	6	11	30	12	18
Loyola (15)	134	160	3	6	—	—	—	—	—	—	—	2	—	—	2	4
McGill ¹ (16)	626	699	28	30	28	24	—	—	15	24	6	14	13	20	13	12
Montreal (17)	340	384	57	83	—	—	41	80	18	35	20	25	23	40	—	—
Sherbrooke (18)	80	120	—	—	—	—	—	—	10	12	3	4	—	—	—	—
Sir Geo. Wms. (19)	623	707	1	4	—	—	—	—	—	—	—	—	—	—	—	3
Carleton (20)	457	510	9	11	6	6	5	—	6	3	4	7	10	10	2	5
Guelph (21)	—	—	22	12	—	—	—	—	9	13	20	23	—	—	—	—
Lakehead (22)	49	60	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Laurentian (23)	120	164	—	—	—	—	—	—	—	—	—	—	—	—	—	—
McMaster (24)	470	495	5	9	9	7	3	3	10	10	7	4	7	9	5	5
Osgoode (25)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ottawa (26)	402	520	8	20	—	—	3	15	14	10	4	7	2	5	9	7
Queen's (27)	412	421	15	18	6	6	—	—	16	15	8	10	30	10	9	16
R.M.C. (28)	77	49	11	11	—	—	—	—	—	—	—	—	—	—	3	9
St. Patrick's . . . (29)	106	130	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toronto (30)	1201	1373	48	59	36	42	15	22	25	30	20	19	—	—	56	79
Waterloo (31)	152	181	—	2	—	1	—	1	—	—	1	5	3	8	13	28
Waterloo Luth. (32)	393	347	2	4	9	2	—	—	—	—	—	—	—	—	—	—
Western (33)	855	880	26	15	9	9	—	—	17	10	14	19	20	22	4	7
Windsor (34)	274	344	7	5	7	8	—	—	2	1	4	3	6	4	1	6
York (35)	93	115	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Alberta (Calg.) (36)	189	297	6	5	1	3	2	3	—	—	5	2	3	4	2	2
Alberta (Ed.) . . . (37)	589	646	5	4	1	5	1	5	3	3	15	17	10	10	3	12
Brandon (38)	95	87	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manitoba (39)	682	748	8	6	—	2	—	—	—	—	14	12	8	10	21	16
Notre Dame (40)	12	44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sask. (Regina) (41)	288	403	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sask. (Saskat'n) (42)	504	753	8	—	7	2	3	—	11	7	11	4	—	—	9	8
U.B.C. (43)	1091	1253	19	22	11	10	1	3	14	16	33	32	13	25	18	20
United College (44)	292	413	1	2	—	—	—	—	—	—	—	—	—	—	—	—
Victoria (45)	199	229	4	3	4	4	—	—	—	—	3	5	1	4	9	8
Estimated Totals	12605	14930	330	390	140	145	95	145	200	215	220	230	180	230	200	290

¹ Graduates in Home Economics, Agriculture and most of Education are located at Macdonald College.

ESTIMATED GRADUATIONS BY DISCIPLINES (1965-66) —TABLE TWO (CONT.)

HONOURS ARTS AND SCIENCE												MISCELLANEOUS COURSES									
Geol.		Geog.		Modern Langs. and Lit.		Others		Agric.		Archit.		Comm. and Bus. Adm.		EDUCATION				Home Ec.		Univ.	
														Diploma		Degree					
65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66		
—	—	—	—	2	1	1	—	—	—	—	—	33	30	17	—	33	—	14	15	(1)	
—	—	—	—	7	6	7	3	—	—	—	—	30	70	—	—	123	—	—	—	(2)	
—	—	—	—	9	4	5	1	—	—	—	—	20	25	102	135	2	3	—	—	(3)	
—	—	—	—	9	9	7	14	—	—	—	—	33	24	7	8	18	10	14	20	(4)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	47	47	52	—	8	6	(5)	
—	—	—	—	—	—	—	—	—	—	5	7	—	—	—	—	—	—	—	—	(6)	
—	—	—	—	—	—	—	—	—	—	—	—	5	11	—	—	—	—	—	—	(7)	
—	—	—	—	—	—	—	—	—	—	—	—	16	48	—	12	14	—	15	13	(8)	
—	—	—	—	4	1	1	1	—	—	—	—	31	31	—	—	18	—	—	—	(9)	
—	—	—	—	—	—	—	—	—	—	—	—	22	44	—	—	22	—	—	—	(10)	
—	—	—	—	3	12	8	11	—	—	—	—	27	33	10	10	47	29	—	—	(11)	
—	—	—	—	5	4	22	29	—	—	—	—	—	—	—	—	21	—	—	—	(12)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(13)	
—	—	8	22	—	—	45	53	40	42	11	12	131	215	114	102	33	—	24	29	(14)	
—	—	—	—	10	8	7	7	—	—	—	—	57	62	—	—	—	—	—	—	(15)	
6	6	3	9	40	62	50	64	74	90	15	17	89	82	343	368	162	—	19	32	(16)	
9	5	—	—	—	—	—	—	—	—	18	24	94	100	—	—	—	—	22	33	(17)	
—	—	—	—	—	—	—	—	—	—	—	—	57	34	223	251	39	—	20	21	(18)	
—	—	—	—	—	6	1	5	—	—	—	—	217	242	—	—	—	—	—	—	(19)	
3	1	2	—	14	8	12	6	—	—	—	—	39	53	—	—	—	—	—	—	(20)	
—	—	—	—	—	—	111	105	162	161	—	—	—	—	—	—	—	—	51	67	(21)	
—	—	—	—	—	5	1	—	—	—	—	—	—	—	—	—	—	—	—	—	(22)	
—	—	—	—	—	—	—	—	—	—	—	—	4	6	—	—	—	—	—	—	(23)	
2	—	13	13	26	46	60	80	—	—	—	—	31	47	—	—	—	—	—	—	(24)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(25)	
—	3	—	—	—	—	—	3	—	—	—	—	91	90	—	—	38	—	10	14	(26)	
6	5	7	2	32	33	30	33	—	—	—	—	78	86	—	—	—	—	—	—	(27)	
—	—	—	—	4	9	8	23	—	—	—	—	—	—	—	—	—	—	—	—	(28)	
—	—	—	—	8	10	13	21	—	—	—	—	18	22	—	—	—	—	—	—	(29)	
6	8	16	21	160	165	193	261	—	—	31	33	71	66	—	—	667	—	19	28	(30)	
—	—	6	5	9	13	15	16	—	—	—	—	—	—	—	—	—	—	—	—	(31)	
—	—	6	12	10	6	33	30	—	—	—	—	20	28	—	—	—	—	—	—	(32)	
1	4	8	20	37	37	50	57	—	—	—	—	58	56	—	—	—	—	7	6	(33)	
—	—	—	—	10	10	9	6	—	—	—	—	21	29	—	—	—	—	—	—	(34)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(35)	
—	2	—	—	2	1	5	4	—	—	—	—	—	—	187	353	—	—	—	—	(36)	
—	3	1	3	7	12	25	31	31	48	—	—	112	165	—	—	19	—	34	29	(37)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	163	—	—	—	—	—	(38)	
9	5	1	—	11	15	10	21	44	38	22	35	71	78	200	—	196	—	49	58	(39)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	1	—	—	—	—	(40)	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(41)	
6	5	—	—	13	2	19	7	50	69	—	—	101	97	591	—	234	240	16	32	(42)	
18	11	5	2	50	50	60	61	46	65	22	21	132	153	342	712	298	—	49	50	(43)	
—	—	—	—	8	15	5	6	—	—	—	—	—	—	—	—	—	—	—	—	(44)	
—	—	1	1	2	10	4	—	—	—	—	—	—	—	—	110	41	—	—	—	(45)	
65	60	75	110	490	560	815	960	445	515	125	150	1710	2025	2440	3345	2070	—	370	450		

ESTIMATED GRADUATIONS BY DISCIPLINES (1965-66) — TABLE TWO (CONT.)

University	MISCELLANEOUS COURSES														APPLIED					
	Law		Library Science		Med. (M.D.)		Nursing		Occupational and Physiotherapy		Pharm.		Phys. Educ.		Social Work		Forestry and Forestry Eng.		Chemical	
	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66
(1)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(2)	34	43	—	—	—	—	9	5	15	15	21	15	—	—	15	28	—	—	—	—
(3)	—	—	—	—	—	—	—	—	—	—	—	—	3	5	—	—	7	9	—	—
(4)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(5)	—	—	—	—	—	—	9	8	—	—	—	—	—	—	—	—	—	—	—	—
(6)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	10
(7)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(8)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(9)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(10)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(11)	20	15	—	—	—	—	10	16	—	—	—	—	10	10	—	—	30	40	3	16
(12)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(13)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(14)	49	67	—	—	—	—	—	—	—	—	23	33	28	29	35	—	37	41	16	21
(15)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
(16)	48	53	85	—	93	95	114	—	7	5	—	—	45	81	54	43	—	—	22	25
(17)	69	120	50	—	92	112	—	—	35	73	66	50	54	65	—	—	—	—	14	17
(18)	17	29	—	—	—	—	—	—	—	—	—	—	—	11	—	—	—	—	—	—
(19)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(20)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(21)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(22)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(23)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(24)	—	—	—	—	—	—	18	21	—	—	—	—	115	40	—	—	—	—	8	15
(25)	136	150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(26)	79	76	46	—	88	88	110	—	—	—	—	—	43	64	—	—	—	—	8	6
(27)	35	39	—	—	51	57	33	—	—	—	—	—	25	18	—	—	—	—	31	18
(28)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	22
(29)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35	40	—	—	—	—
(30)	69	113	111	—	126	158	29	51	106	83	96	100	—	68	111	—	24	33	40	50
(31)	—	—	—	—	—	—	—	—	—	—	—	—	41	—	—	—	—	—	12	17
(32)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(33)	34	49	—	—	56	55	49	—	—	—	—	—	29	24	—	—	—	—	9	9
(34)	—	—	—	—	—	—	16	—	—	—	—	—	—	—	—	—	—	—	9	10
(35)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(36)	—	—	—	—	—	—	2	12	28	—	—	—	15	—	—	—	—	—	—	—
(37)	28	41	—	—	57	58	29	30	—	18	31	74	45	67	—	—	—	—	38	24
(38)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(39)	37	29	—	—	52	51	43	34	34	48	24	30	—	—	59	—	—	—	—	—
(40)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(41)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(42)	25	29	—	—	33	33	—	—	—	—	46	74	19	27	—	—	—	—	15	17
(43)	65	88	53	—	44	56	33	31	—	—	33	45	50	63	135	—	45	45	18	27
(44)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(45)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	745	940	345	—	690	765	500	570	210	270	340	420	510	590	445	—	145	170	280	305

ESTIMATED GRADUATIONS BY DISCIPLINES (1965-66) — TABLE TWO (CONC.)

SCIENCE AND ENGINEERING																
Civil		Elect.		Geol.		Mech.		Metal.		Mining		Physics		Others		
65	66	65	66	65	66	65	66	65	66	65	66	65	66	65	66	University
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(1) Acadia
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(2) Dalhousie
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(3) Memorial
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(4) Mount Allison
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(5) Mt. St. Vincent
51	48	35	36	—	2	24	57	1	6	2	3	—	—	—	—	(6) N.S. Tech.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(7) St. Dunstons
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(8) St. F. Xavier
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(9) St. Mary's
40	27	42	45	—	—	25	15	—	—	—	—	—	—	—	—	(10) U. of Moncton
—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	6 ²	(11) U.N.B.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(12) Bishop's
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(13) Coll. Ste. Marie
29	46	32	35	7	8	18	27	14	7	4	6	17	20	—	—	(14) Laval
7	7	8	4	—	—	5	5	—	—	—	—	—	—	—	—	(15) Loyola
24	29	70	68	—	—	35	37	14	6	1	2	—	—	—	—	(16) McGill ¹
65	63	42	42	5	4	36	51	12	13	5	6	12	14	—	—	(17) Montreal
13	15	12	15	—	—	6	6	—	—	—	—	—	—	—	—	(18) Sherbrooke
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(19) Sir Geo. Wms.
8	13	12	18	—	—	12	18	—	—	—	—	—	—	—	—	(20) Carleton
—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	22	(21) Guelph
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(22) Lakehead
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(23) Laurentian
9	10	11	10	—	—	9	9	6	10	—	—	7	4	—	—	(24) McMaster
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(25) Osgoode
—	7	6	18	—	—	—	—	—	—	—	—	—	—	—	—	(26) Ottawa
43	44	26	40	6	5	33	28	17	13	4	6	16	6	—	—	(27) Queen's
18	15	25	20	—	—	21	24	—	—	—	—	7	6	—	—	(28) R.M.C.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(29) St. Patrick's
55	47	53	65	5	5	31	50	11	15	7	7	44	44	19	34 ³	(30) Toronto
22	45	33	47	—	—	34	35	—	—	—	—	7	—	—	—	(31) Waterloo
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(32) Waterloo Luth.
—	14	10	12	—	—	9	15	—	—	—	—	—	—	—	—	(33) Western
—	13	1	9	—	—	—	10	—	—	—	—	—	7	—	—	(34) Windsor
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(35) York
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(36) Alberta (Calgary)
33	46	49	46	—	—	10	13	10	12	—	1	7	1	—	—	(37) Alberta (Edmon.)
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(38) Brandon
52	39	44	37	4	1	48	52	—	—	—	—	2	—	—	—	(39) Manitoba
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(40) Notre Dame
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(41) Sask. (Regina)
34	27	27	30	1	4	41	37	—	—	1	6	11	13	17	15	(42) Sask. (Saskatoon)
26	22	54	55	8	7	30	30	24	25	8	4	10	2	2	—	(43) U.B.C.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(44) United College
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(45) Victoria
530	580	595	630	35	35	425	530	110	105	35	40	140	115	55	75	Estimated Totals

¹ Graduates in Home Economics, Agriculture, and most of Education are located at Macdonald College.

² Graduates in Survey Engineering.

³ Graduates in Industrial Engineering.

TABLE THREE—HIGHER DEGREES—CHEMICAL ENGINEERING GRADUATIONS

University	Masters			Ph.D.		
	Year of Graduation			Year of Graduation		
	1963	1964	1965	1963	1964	1965
N.S. Tech.	3	3	3	—	1	1
U.N.B.	8	11	9	—	—	3
U. of Mtl.	2	4	2	—	—	1
Laval	2	3	6	1	1	—
McGill	4	2	3	8	9	9
McMaster	6	11	16	—	2	4
Queen's	2	4	5	—	—	1
Ottawa	2	3	12	3	7	7
Toronto	10	9	15	7	7	10
Western	—	3	5	—	—	—
Windsor	3	5	5	—	—	1
U. Waterloo	3	4	10	—	—	1
Sask.	2	5	3	1	1	—
Alta. (Edmon.)	10	10	14	4	2	8
U.B.C.	7	5	5	1	2	1
Total	64	82	113	25	32	47

TABLE FOUR—HIGHER DEGREES—CHEMISTRY GRADUATIONS

University	Masters			Ph.D.		
	Year of Graduation			Year of Graduation		
	1963	1964	1965	1963	1964	1965
Acadia	1	3	2	—	—	—
Dalhousie	3	1	—	1	—	—
Memorial	—	3	4	—	—	—
Mount Allison	3	—	2	—	—	—
St. F. Xavier	2	3	4	—	—	—
U.N.B.	2	2	4	3	6	6
U. Moncton	—	1	1	—	—	—
Macdonald	—	—	8	—	—	2
McGill	25	30	22	44	51	40
Montreal	13	11	14	5	9	9
Laval	3	8	5	4	12	8
Carleton	1	4	5	—	2	—
McMaster	13	9	10	10	14	16
Ottawa	6	2	7	10	6	8
Queen's	17	20	20	4	8	14
Toronto	21	34	46	11	28	33
Western	7	10	3	9	12	20
Windsor	—	1	6	4	7	1
U. Waterloo	1	4	6	—	—	—
Manitoba	1	11	12	1	7	4
Sask.	6	13	15	9	9	6
Alta. (Calgary)	3	2	5	5	4	6
Alta. (Edmonton)	6	6	2	25	32	31
U.B.C.	13	18	12	7	22	21
Total	147	196	215	152	229	225

**TABLE FIVE—HIGHER DEGREES—METALLURGY AND
METALLURGICAL ENGINEERING GRADUATIONS**

University	Masters				Ph.D.			
	Year of Graduation				Year of Graduation			
	1962	1963	1964	1965	1962	1963	1964	1965
N.S. Tech.	—	—	—	1	—	—	—	—
U. of Mtl.	—	2	—	2	—	—	—	1
Laval	1	1	—	1	—	1	—	2
McGill	1	—	3	4	—	—	1	2
McMaster	2	2	2	10	1	—	—	4
Queen's	2	3	1	3	—	—	—	—
Toronto	5	3	—	8	4	2	4	7
Alta. (Edmon.) ..	6	3	—	10	—	1	1	2
U.B.C.	7	4	12	4	1	2	1	4
Total	24	18	18	43	6	6	7	22

TABLE SIX—HIGHER DEGREES—MINING ENGINEERING—GRADUATIONS

University	Masters				Ph.D.			
	Year of Graduation				Year of Graduation			
	1962	1963	1964	1965	1962	1963	1964	1965
N.S. Tech.	—	—	—	1	—	—	—	—
U. Montreal	—	—	1	1	—	—	—	—
McGill	1	1	2	7	—	—	—	2
Queen's	4	3	1	1	—	—	—	2
Alta. (Edmon.) ..	—	—	—	1	—	—	—	—
U.B.C.	—	—	1	—	—	—	—	—
Total	5	4	5	11	—	—	—	4

**TABLE SEVEN—HIGHER DEGREES—GEOLOGY AND
GEOLOGICAL ENGINEERING GRADUATIONS**

University	Masters				Ph.D.			
	Year of Graduation				Year of Graduation			
	1962	1963	1964	1965	1962	1963	1964	1965
Acadia	1	—	—	—	—	—	—	—
Dalhousie	1	4	3	1	—	—	—	1
Memorial	1	2	—	3	—	—	—	—
Mount Allison ..	—	—	—	—	—	—	—	1
U.N.B.	6	4	2	6	—	3	—	—
Laval	—	4	1	2	—	—	4	4
U. Montreal	—	3	—	2	—	—	—	—
McGill	13	9	4	9	5	4	6	7
Queen's	—	5	3	12	—	4	1	4
Carleton	4	4	1	7	—	—	—	4
Ottawa	—	—	1	1	—	—	2	3
Toronto	13	3	4	15	3	3	5	9
Western	1	3	4	2	—	—	—	1
McMaster	4	7	2	4	1	—	—	7
Manitoba	2	2	5	9	—	—	—	5
Sask.	9	5	5	7	—	—	1	2
Alta. (Edmon.) ..	12	5	4	13	1	—	1	9
U.B.C.	5	2	5	5	1	—	3	7
Total	72	62	44	98	11	14	23	64



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~~1965/66~~

Canada. National Employment
Service

Supply and demand; univer-
sity graduates

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

DECATALOGUED

